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OCTOBER 19, 1961

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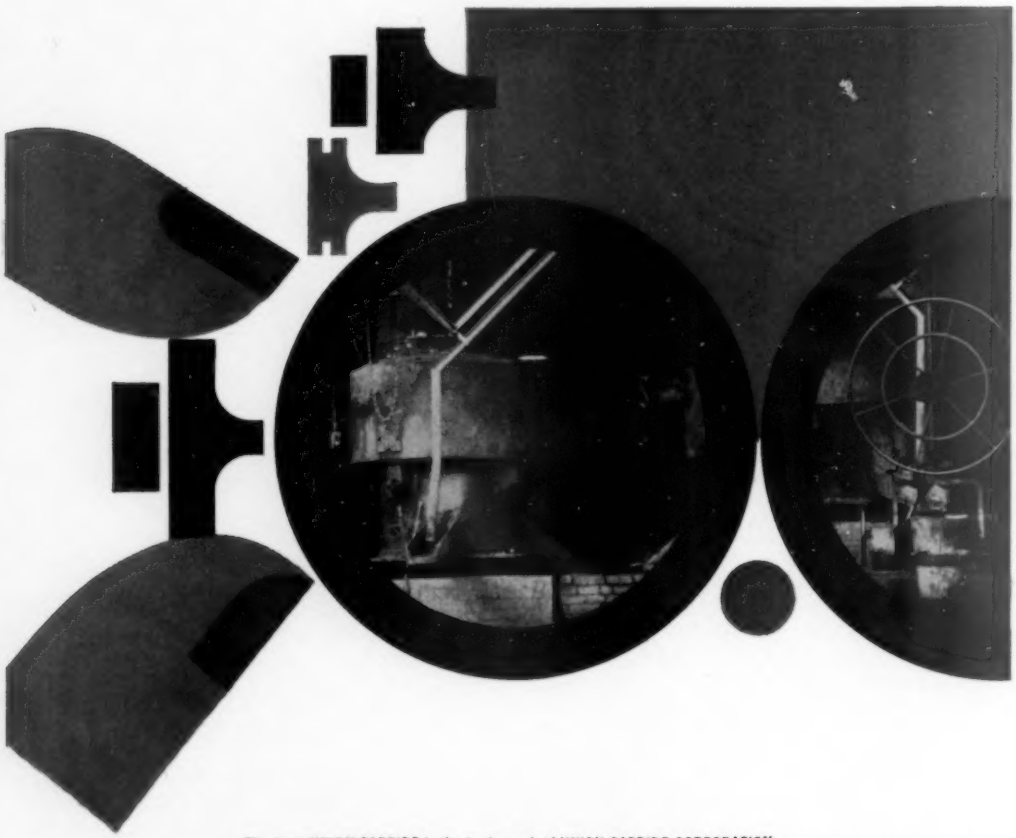

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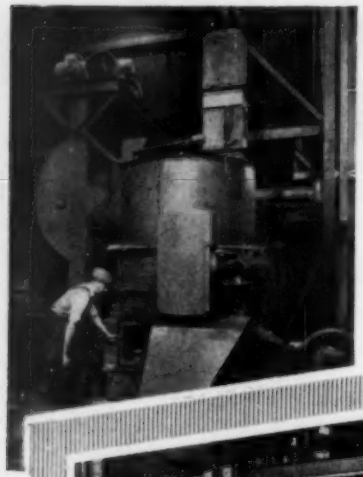
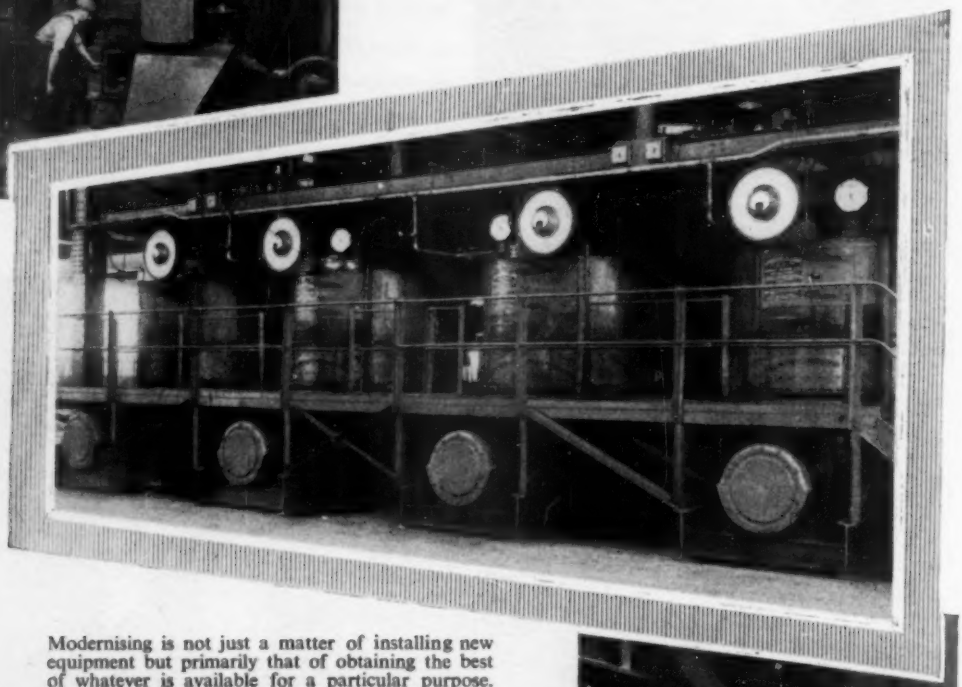


More and more modern foundries

are specifying the

*SPEED*MULLOR

to mull their mould or core sand



Modernising is not just a matter of installing new equipment but primarily that of obtaining the best of whatever is available for a particular purpose. That is why more and more modern foundries choose the Speedmullor for the preparation of their sand. One single foundry in this country operates 10 Speedmullors and one multiple company uses 14. More foundry sand is mulled in Speedmullors than by any other method because, only Speedmullor mulling can develop the full physical properties of moulding sand and core sand mixtures with minimum bond and at lowest cost per ton of sand mulled. Full development of physical properties with maximum Speedmullor uniformity and control provides higher quality castings with better surface finish and the elimination of casting defects.

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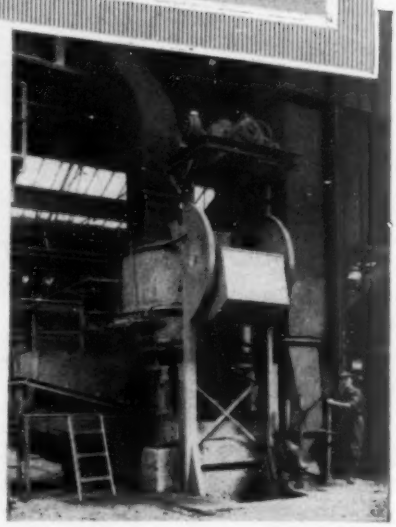

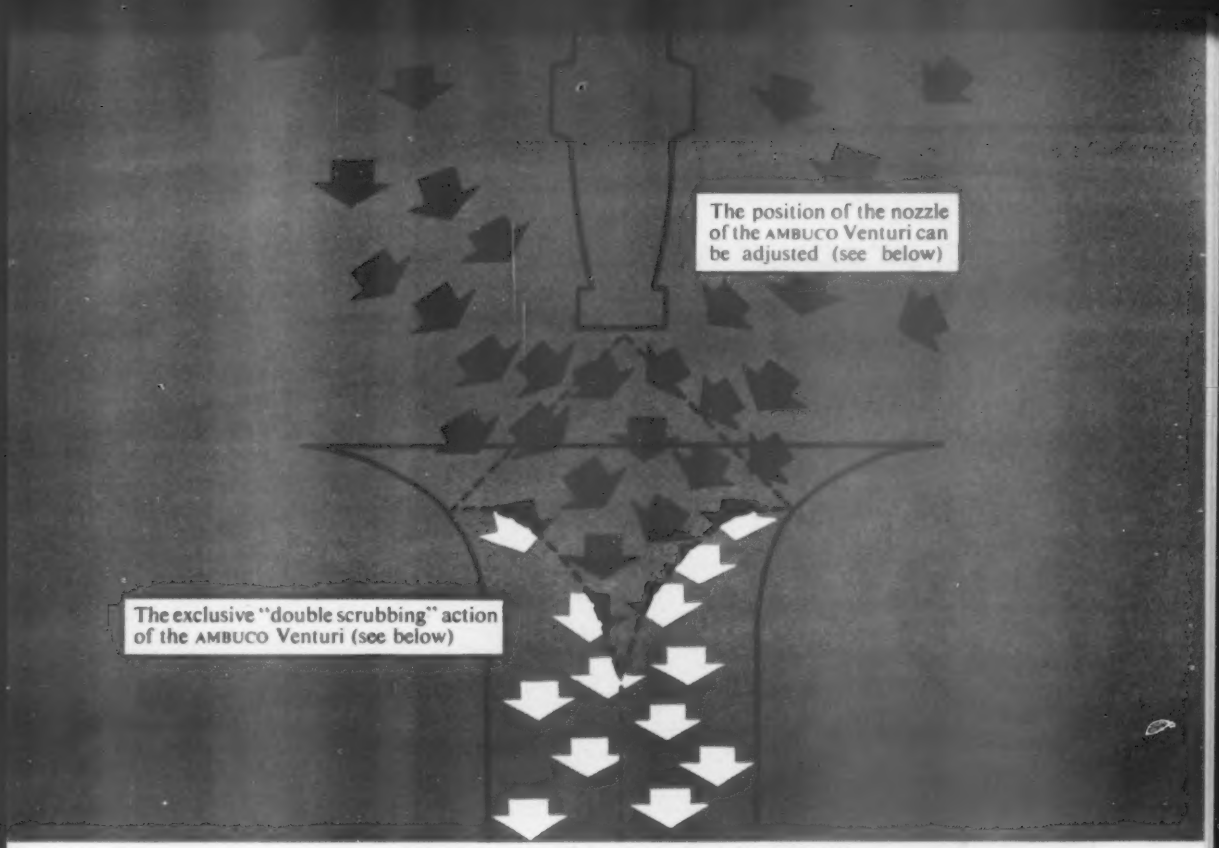
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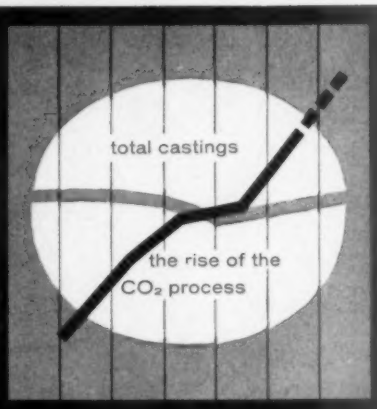

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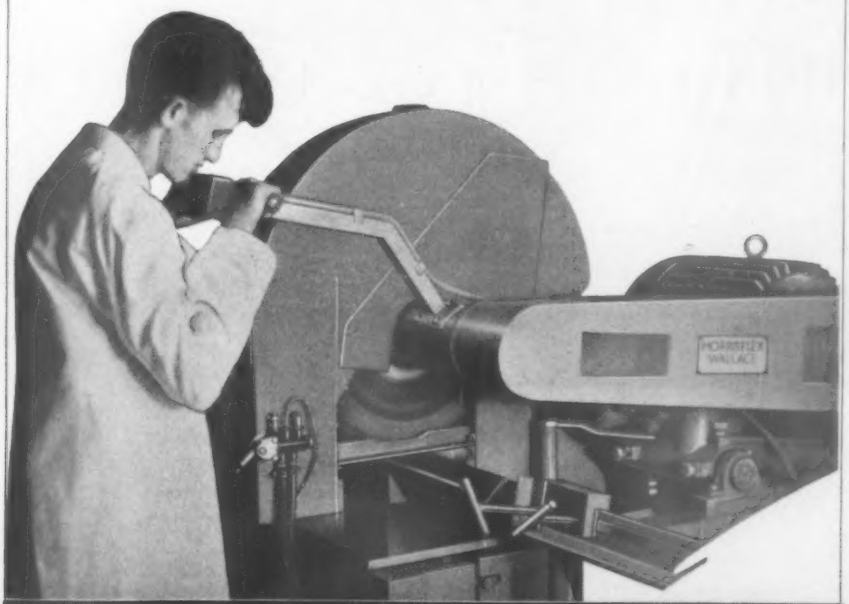

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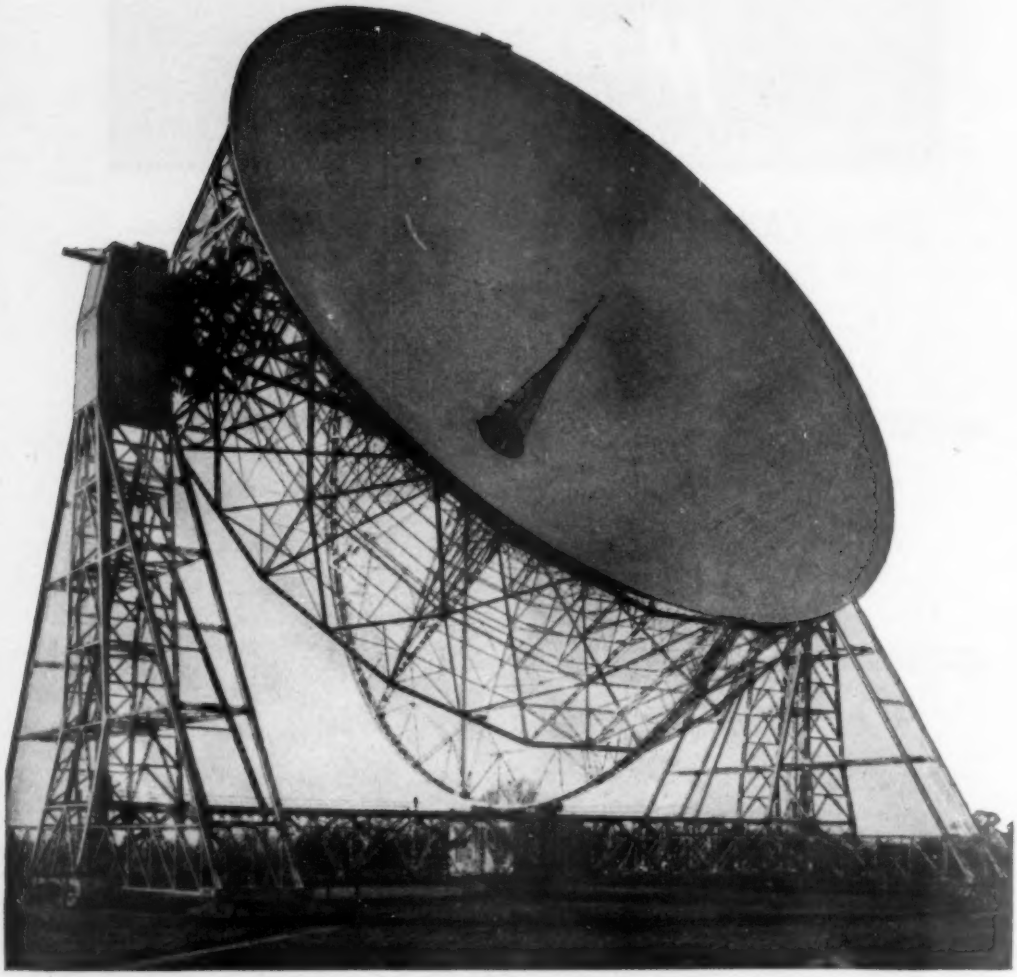

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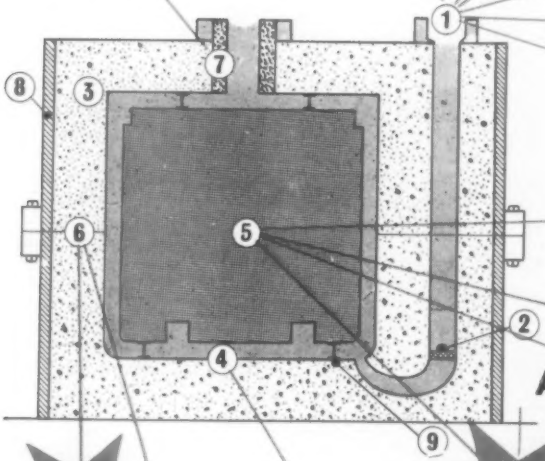

Key to Sectional Drawing of Mould

		Send for booklet No.
1	Metallurgical Control use of Fluxes	3
2	Clean Metal by using Ceramic Strainer Cores and Discs.	4
3	Coal Dust additional to Facing and Backing Sand	1
4	Silverskin Blackings, Plumbago and Mould Dressings.	1
5	Cores using Crulin and Crudol Core Binders (Oil Bonded, Air Setting Cereal or CO.2 Binders).	2
6	Moulds Parted with Beecro Silica Free Parting Powder or Beecrol Parting Liquid.	1
7	Casting Feeding with Alsica Exothermic Feeder Heads.	4
8	Moulding Boxes supplied by B.F.U. Chaplets, Studs, etc.	5

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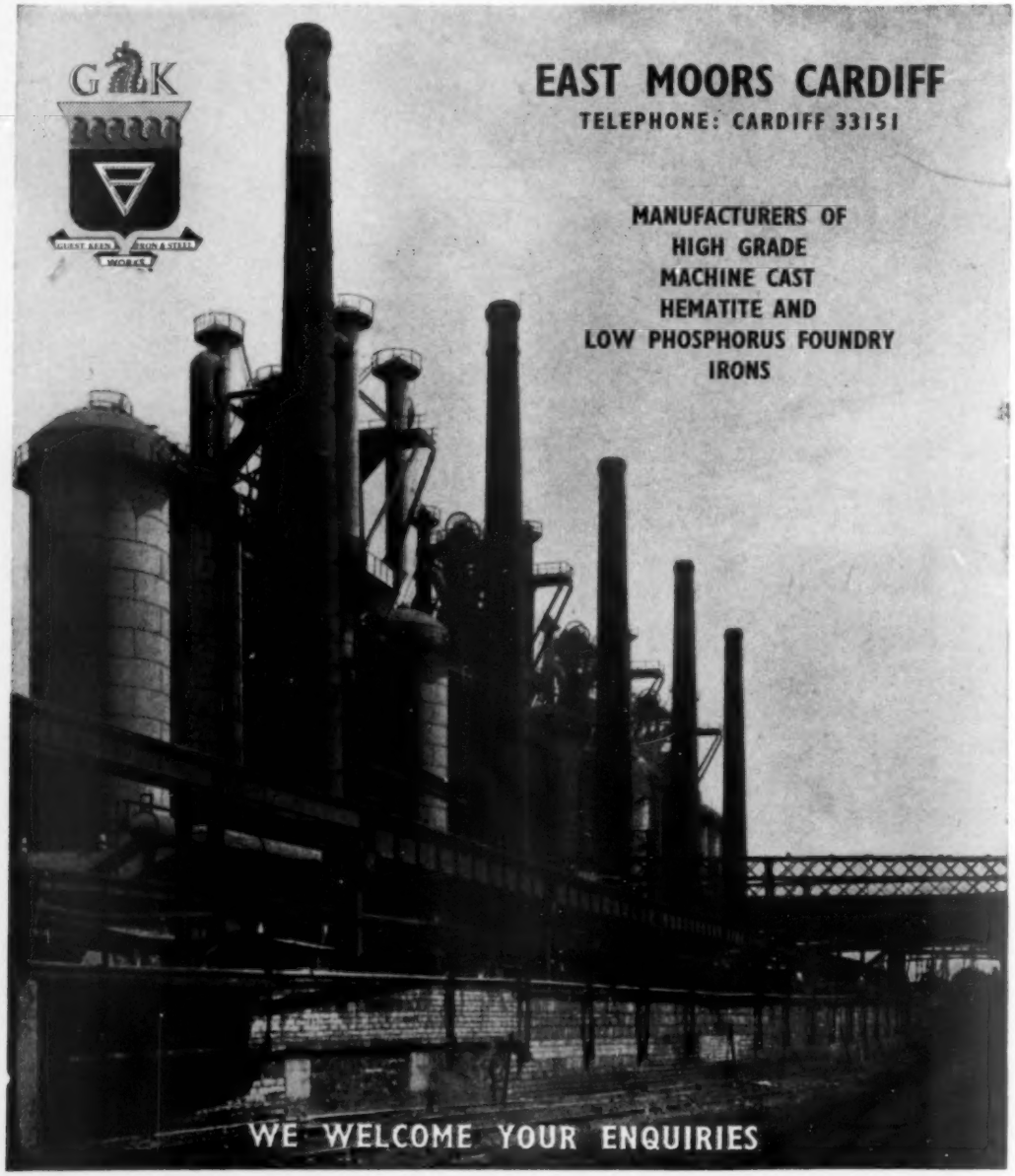
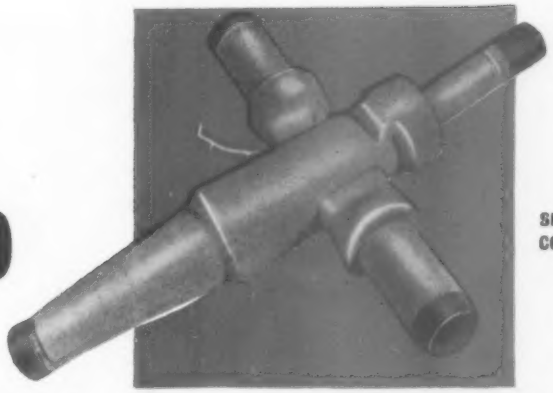


A FREE METALLURGICAL SERVICE IS AVAILABLE AND YOU ARE INVITED TO CONSULT US ON ANY FOUNDRY PROBLEMS

CHELFORD



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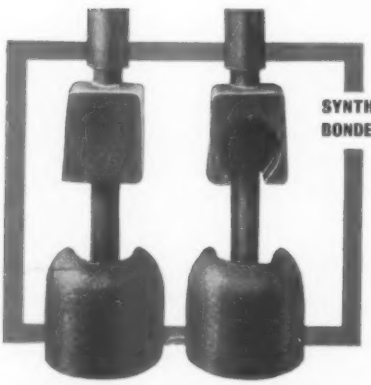

SYNTHETICALLY BONDED CORE

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CO_2 SILICATE PROCESS
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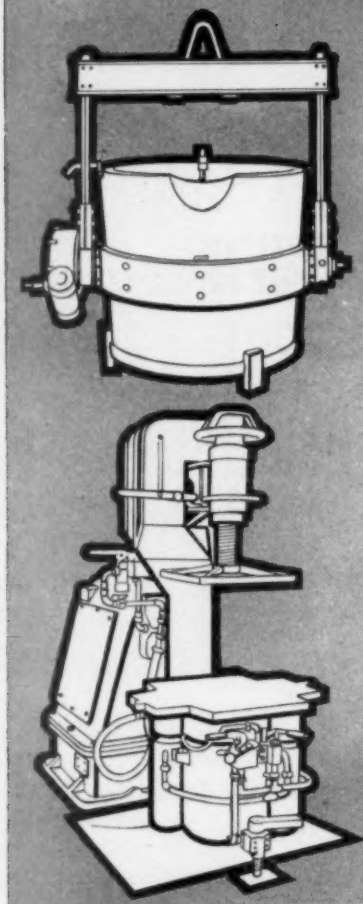

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PP19

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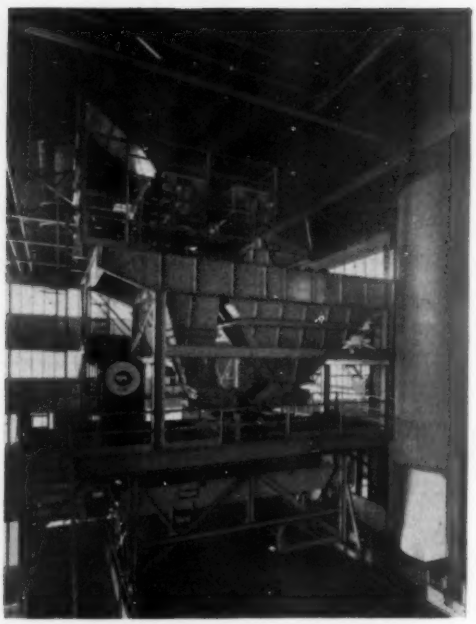

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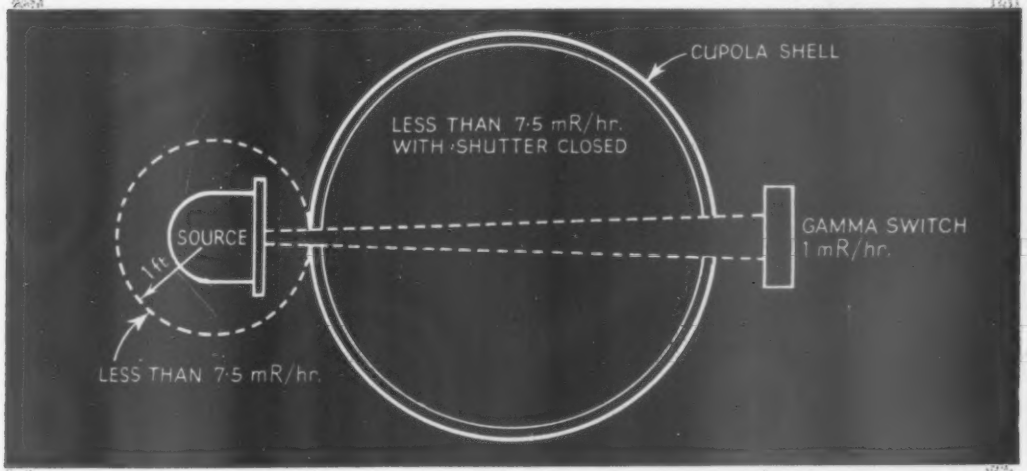

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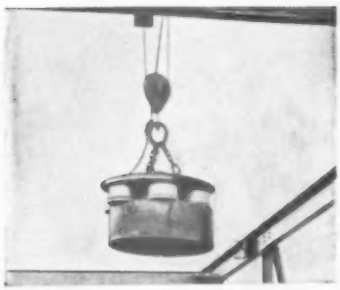

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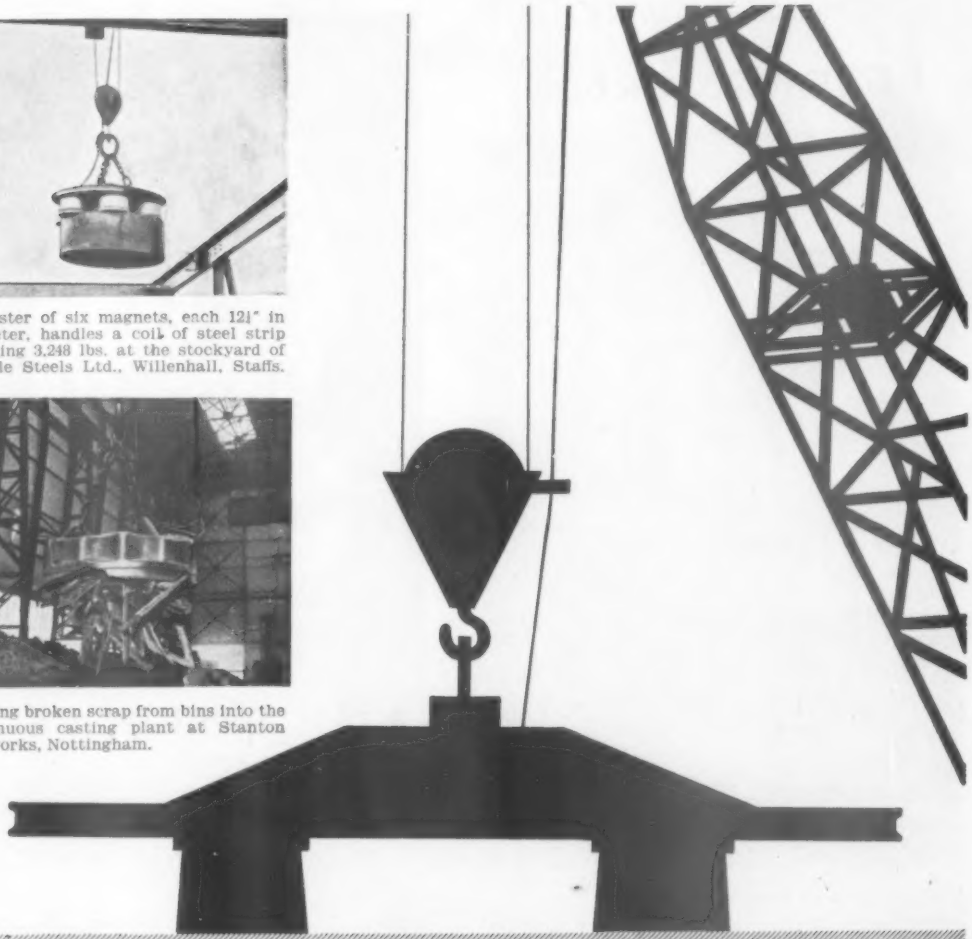

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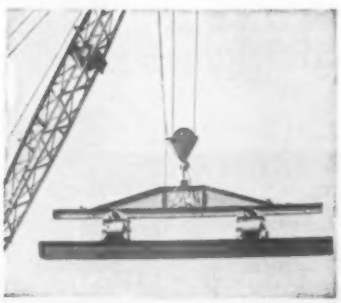

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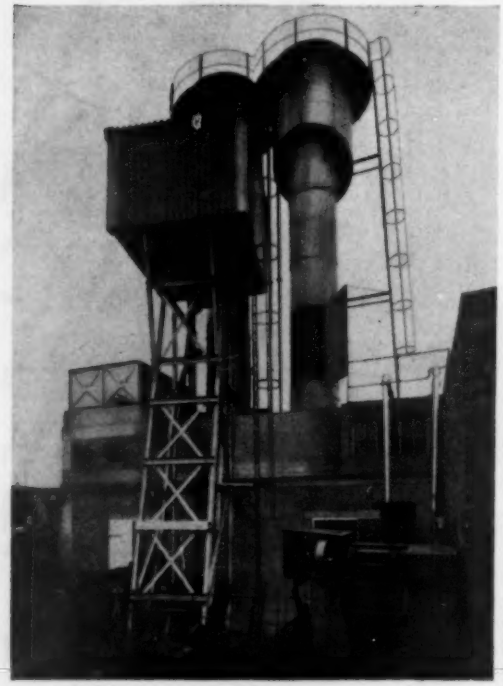

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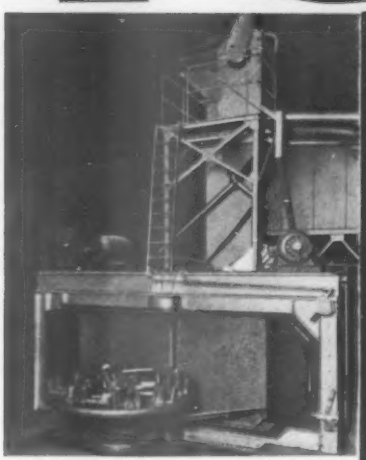

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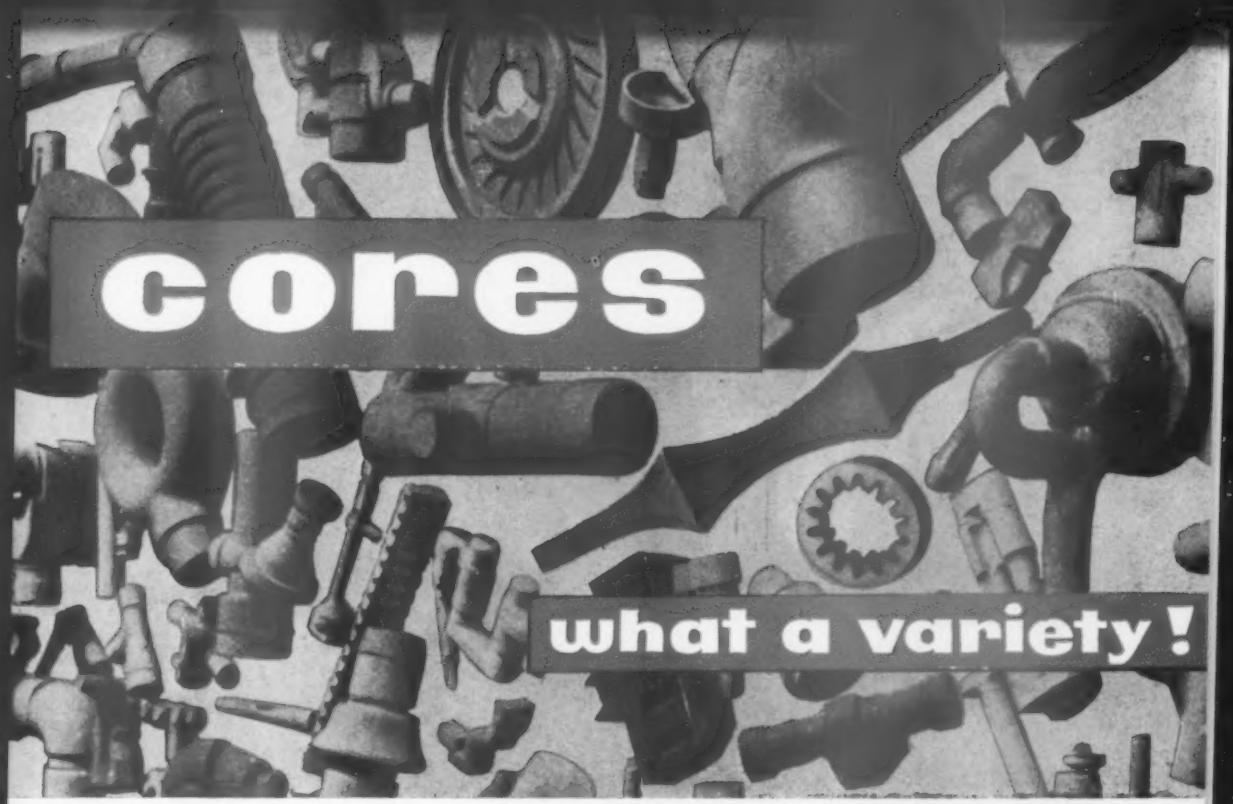

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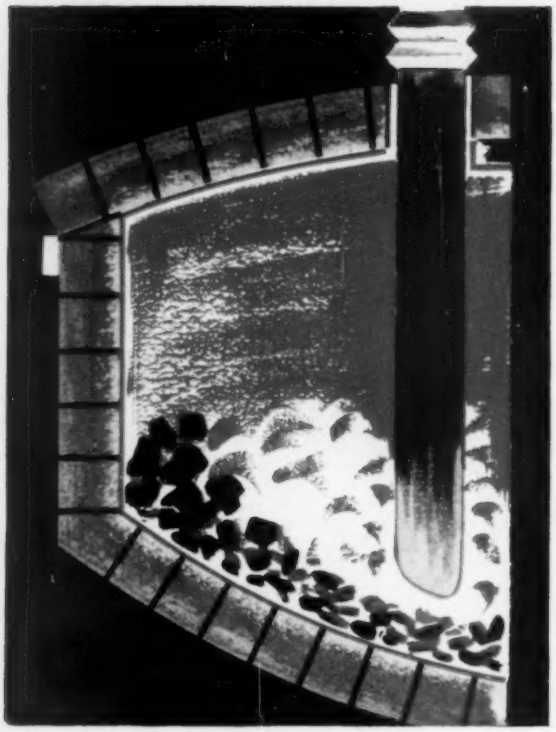

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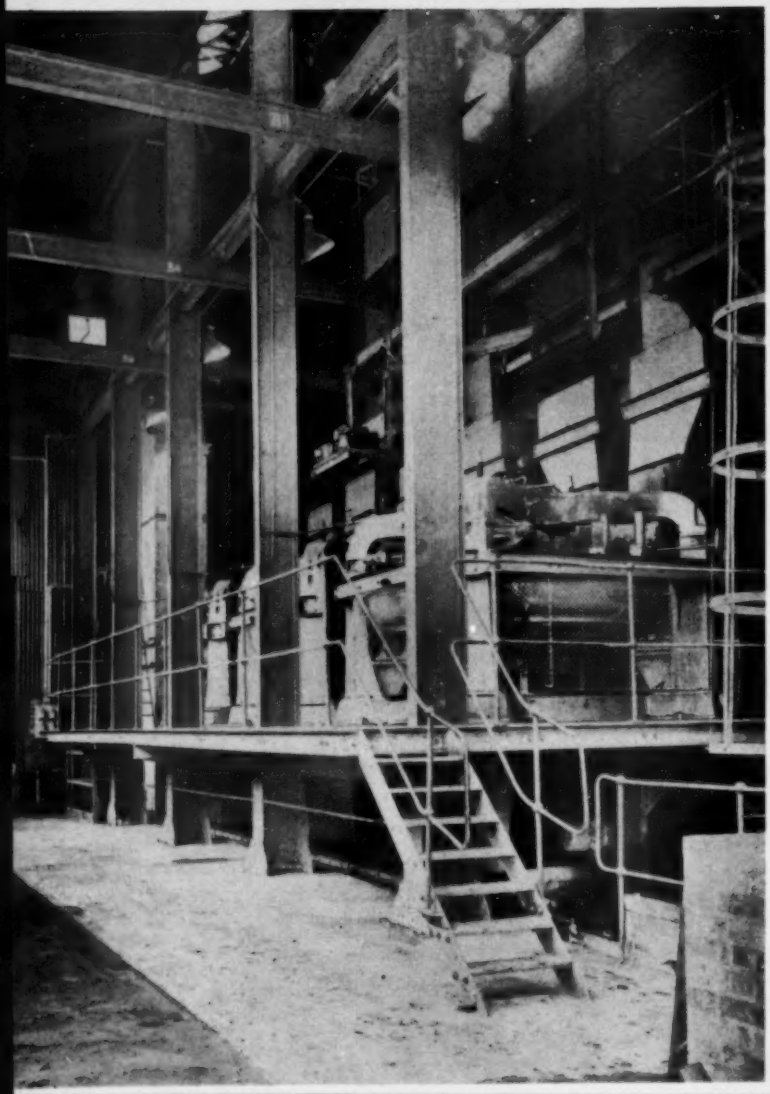

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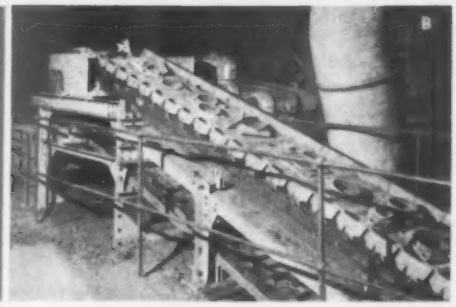
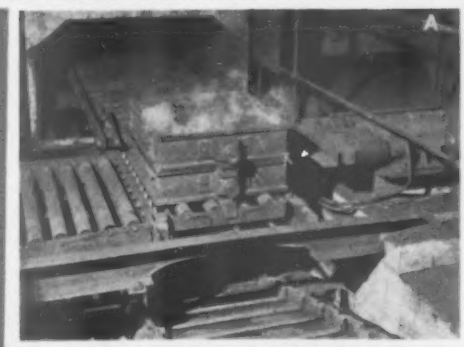
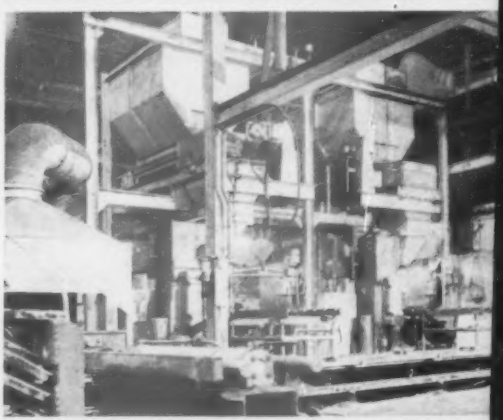


Casting Conveyor. Inset A. shows discharge end of automatic shakeout, empty box return unit and castings discard. Sand falls through shakeout and returns to system. Inset B. shows heavy duty hot castings conveyor from automatic shakeout.





General View of Semi-Automatic Special Moulding Unit showing sand feed system, mould conveyor and handling plant.

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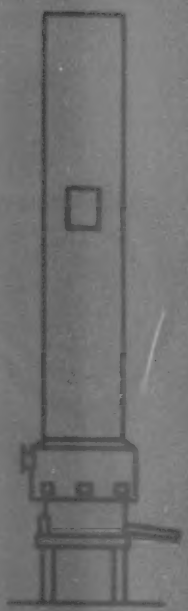

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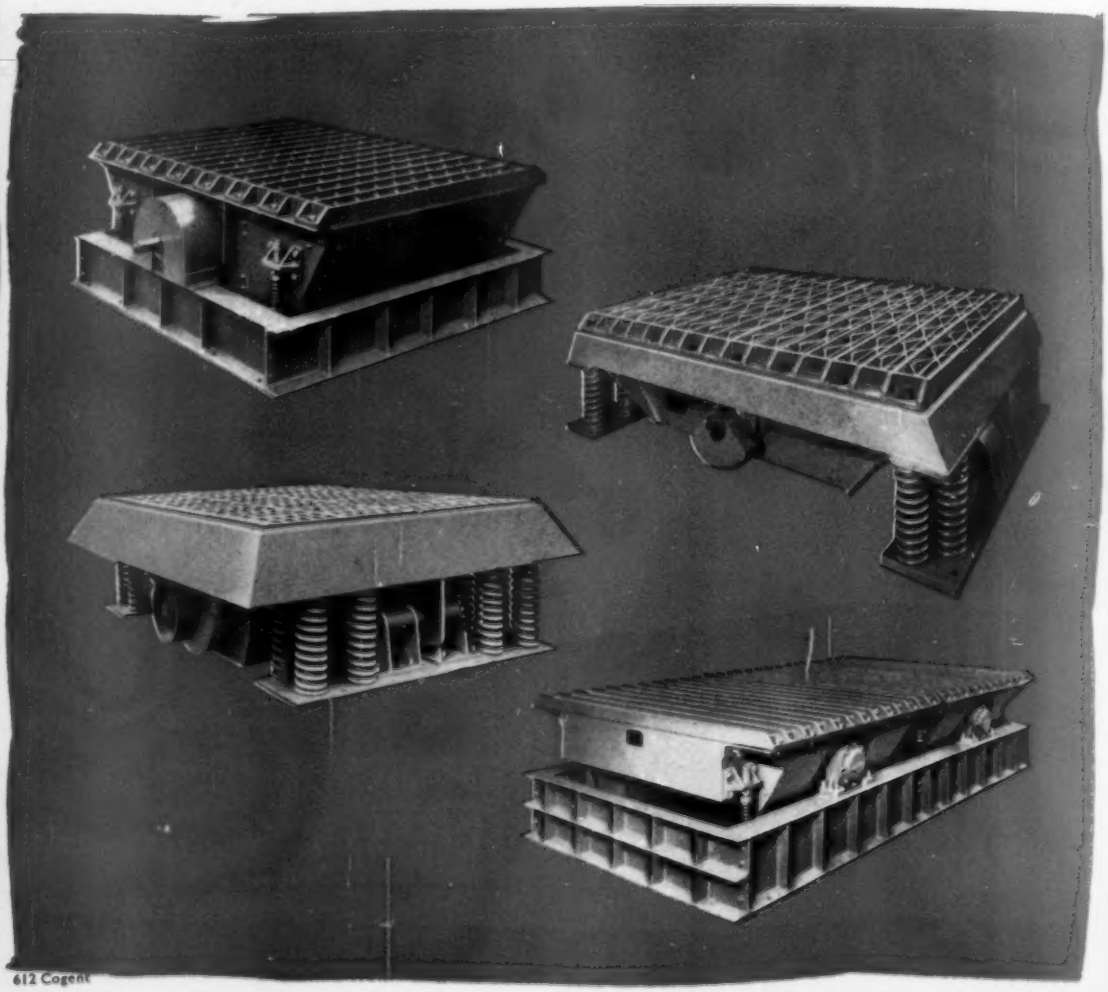

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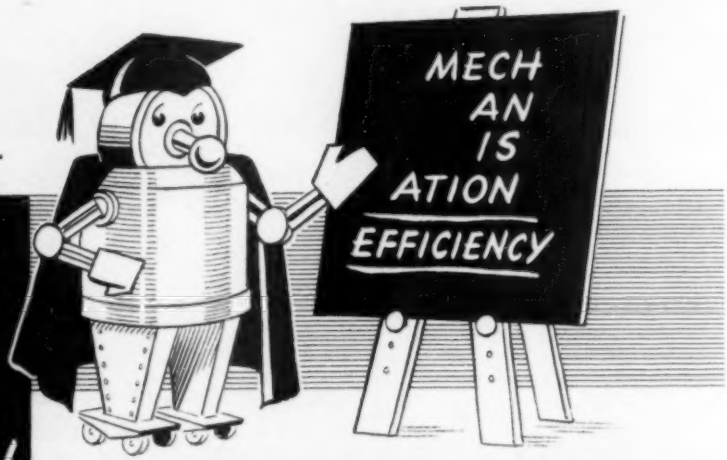

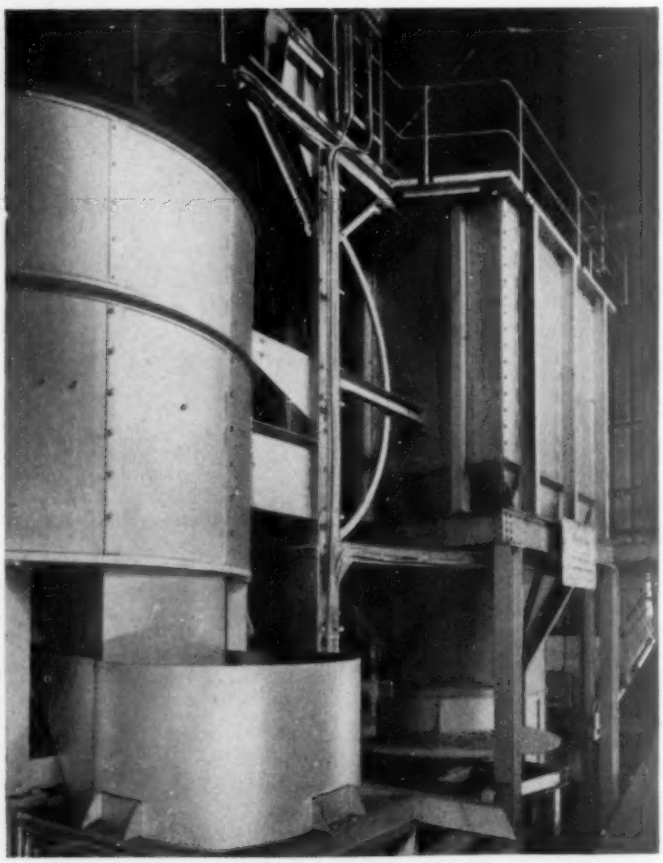

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FOUNDRY
TRADE JOURNAL
Vol. 111 October 19, 1961 No. 2341

Decline of Team Games

Even before 1914, the foundry industry was prominent in the provision of cricket and football facilities for its employees. Now, however, an article in the Federation of British Industries *Review* by Mr. J. Hennessy suggests that the time is ripe for an appraisal of the situation to be made. He bases this on a sample survey undertaken by the Federation and on the changes that have taken place in recent years in the day-to-day life of the average working man. There is a marked lessening of attendance at football and cricket matches, and a decrease (over a thousand) in the number of active amateur football clubs. On the other hand, there has been a substantial increase of interest in ski-ing, golf, tennis, angling, bowls, dancing and even archery. Thus, he sees a decline in participation in team games and an increasing trend to develop games for the individual. If the " do-it-yourself " craze can be regarded as a recreational activity, then this, too, should be taken into consideration.

Briefly, the survey showed that 74 per cent. of the firms had full facilities for organized sport, whilst 22 per cent. had none. In the past the figure of 500 employees was suggested as a minimum number to make the provision of large-scale facilities worthwhile, as there was always a large percentage who either had no interest in arrangements or preferred to make their own, and spend their leisure with friends of their own choosing. From the dozens of house organs received in the JOURNAL office we find that some firms report in full the activities of their team games, but most give extensive space to dances and other social gatherings.

The following activities are suggested as worthy of the attention of those whose job it is to organize recreational facilities for workpeople. Where team games are insufficiently supported, no doubt arrangements could usefully be made with nearby clubs for close association. The grounds then made available could be altered to provide for individual games—covered tennis-courts, bowling greens or swimming pools, " do-it-yourself" clubs, croquet, archery and so forth. Where, however, the full sports facilities are enthusiastically used, then firms are recommended to let well alone, for the situation approaches the ideal. The point is made that in this changing world, it is essential periodically to review the situation and where possible to introduce change in sports facilities, as only too often the success of a section rests too heavily on the enthusiasm of one man.

Shaw Process International Conference

London was chosen as the venue for the annual meeting of licensees of the Shaw Process. The meeting was held on October 10 at the Institute of Directors in Belgrave Square and attracted delegates from eleven countries, no fewer than eight coming from the USA. For the first session, Mr. Noel Shaw presided, and after welcoming the delegates, he asked Mr. L. Avnet (president of Avnet Electronics Corporation of New York) to address the meeting. Mr. Avnet heads a $20 million concern which, *inter alia*, own the North and South American Patents for the Shaw Process. It was reported that the speaker's firm employs over 1,000 scientists and technicians and their contribution to the development of the Shaw Process was the installation of 28,000 sq. ft. research laboratory where, in an air-conditioned atmosphere, large-scale tests would be carried out into the complete mechanization of the Process, to include also raw-material reclamation. For this purpose, a *cadre* of ceramic technologists had been formed who would have the help of a qualified metallurgist.

Break-through in the Foundry Industry?

The next speaker was Dr. G. Found, consultant to the Shaw Process Development Corporation in America. He presented a well-documented and provocative paper entitled "The Shaw Process—is this a Break-through in the Foundry Industry?"* As the general theme of the Conference was the mechanization of the Process, the author supplied figures to show that in the case of certain malleable castings, the Shaw Process could produce castings more cheaply than by conventional methods. At least, he said, the American malleable ironfoundry employers' association is sufficiently impressed to devote a special meeting for the consideration of the subject. He referred to American grey-iron manufacture as a depressed industry, only working at 50 per cent. capacity, and reported that its progress of three per cent. profit return per annum ranked as the second lowest of all American industries. Die-casting was trebling its production every five years, he added. Dr. Found—like all other leaders of thought in the foundry industry—was anxious to get the enthusiastic co-operation of designers of components.

After this lecture, a series of coloured slides with appropriate commentary was presented by Mr. I. Lubalin (executive vice-president, Shaw Process Development Corporation). It was an example of really forthright propaganda redolent of American advertising expertise.

A general discussion, mainly on mechanization, followed. During the course of this, Mr. V C. Faulkner pointed out that the picture presented of the grey-iron industry in America did not reflect the conditions in this country or even Europe, where the industry was expanding at a reasonable rate. Mr. J. Kinsella (of Precision Alloys, Limited, Dublin) presented some interesting figures of costs of production for a range of castings. He quoted mould costs for greensand; resin-bonded sand (shell) and Shaw material, but pointed out that quite different figures would be given when taking a set casting or a wide range of products as a basis. Mr. R. J. Hammond (of Blackburn Aircraft, Limited) also stressed the need for enlightening designers on the nature of the Shaw Process in order to get their co-operation.

* An abstract of Dr. Found's paper will be published in a forthcoming issue of the JOURNAL.

Short talks were then given by Mr. J. Marshall on behalf of Nicholas Herzmark of Paris, the European concessionaire for the Shaw Process, and Mr. S. Sundra of Shaw Processes (India) Private, Limited. The former detailed several aspects of the progress registered, but dealt mainly with the reclamation of raw materials, whilst the latter reported on the favourable start which had been made in India.

Afternoon Session

After a break for luncheon, the session was resumed under the chairmanship of Mr. Clifford Shaw, when four technical contributions were presented. The first was given by Mr. D. Winter (of Innsworth Metals, Limited) who said that his foundry operated with about 25 people and specialized in the manufacture of aluminium-bronze. Often regarded as a difficult alloy to handle by conventional methods, he said it gave excellent results as a Shaw Process product. Mr. R. W. Eade (of J. Stone & Company (Charlton), Limited) demonstrated by figures and actual examples, the application of the Shaw Process for the manufacture of magnesium castings. Mr. H. Sjoberg (of Aktiebolaget Kanthal) detailed a number of experiments he had carried out in his foundry on the subject of material reclamation and the results obtained were shown by samples passed round amongst the audience and by coloured slides. The last contribution of the session was presented by Mr. J. Wandrisco (of Latrobe Steel Company), whose company was an important American machine-tool and special-steel concern. The researches he described covered metallic losses when melting steels under conditions met with in precision foundries and the carbon pick-up under certain circumstances. These figures he thought would be useful for the smaller firms among the licensees, who did not operate their own laboratories. In any case gains and losses, he said, should be established by resort to outside consulting laboratories.

The next day, October 11, by invitation of Mr. A. S. Beech, delegates to the Conference visited the works of Foundry Equipment, Limited, Leighton Buzzard, where a paper on "Mechanization of the Shaw Process" was presented jointly by two members of the staff, Mr. R. Symonds and Mr. G. Brown. This was followed by a demonstration of the prototype plant and an Open Forum, chaired by Mr. Lubalin.

International Patternmaking Group

International Patternmakers, Limited, a British export company, has just received a substantial repeat contract for high-quality metal patterns and foundry tooling from a leading West German motor-car manufacturer. With its head office at Alliance Works, Darlington, International Patternmakers, Limited, was formed in 1959 by a group of master craftsmen patternmaking firms in Birmingham, Darlington, Leamington, Leeds, Leicester, and Manchester to develop the export of pattern equipment, dies, foundry tooling and equipment. It is probably the largest organizaton of its kind in the world. Contracts have been successfully completed for foundries in Sweden, West Germany, Portugal, Switzerland, Yugoslavia, and Israel.

CYRIL ADAMS & COMPANY, LIMITED—Sir Ben Lockspeiser has been appointed to the board of the company, a member of the Staveley group. He is scientific adviser to the group and is on the board of Staveley Industries, Limited, the parent company.

Foundry "Hotpot" for IBF Visitors

Details of Establishments in the Manchester Area which are to receive Parties on October 27.

Continuing the account of various types of Lancashire foundries which are to be visited on National Works Visits Day organized on this occasion by the Lancashire branch of the Institute of British Foundrymen at the end of this month, the present issue carries the reviews over the remaining seven concerns. This concluding section starts with the works of Walmsley (Bury) Group, Limited, whose new foundry is shown in the heading block above and is followed by descriptions of: Associated Electrical Industries (Manchester), Limited, Henry Wallwork & Company, Limited, Linotype & Machinery, Limited, British Railways' Horwich Locomotive Works, Gresham & Craven, Limited, and George Richards & Company, Limited.

(Continued from page 451)

Walmsley (Bury) Group, Limited

When he founded his small engineering firm in his native town of Bury in 1866, Charles Walmsley showed exceptional vision, for the town was destined to become one of the most important papermaking centres not only in England, but also in the world. At first, the founder employed one other employee, but soon the number of workpeople was increased from two to 20, and within another short perod of time, to 100. At present, the Walmsley Group employs no fewer than 2,000 in its five factories at Bury and Wigan, and this number will be increased to 2,500 when the company's new works, presently nearing completion, at Bolton come into production.

History

In 1891, the small business founded by Charles Walmsley became a limited company and in the space of a few years only, large extensions to the company's Atlas Works were taking place in order to cope with the growing volume of orders. Heavy and valuable machine-tools were installed and, in 1897, the company received its first order for a complete papermaking machine, reputed at the time to be the largest of its type in the world. Over the years, the high standard of workmanship at Walmsleys Atlas Works became a tradition and during the 1914-18 war, work was carried out for the Ministry of Munitions, the Admiralty and the War Office. During the second world war, the company was also engaged on contracts for the Ministry of Supply, the Admiralty, and the Ministry of Aircraft Production.

Since then, quite a number of firms have become members of the Walmsley Group and much new building and many extensions have been carried out over the years, *e.g.*, new buildings and extensions have been added to each of the branches of the Group and a large re-tooling and re-equipment programme has been successfully carried through.

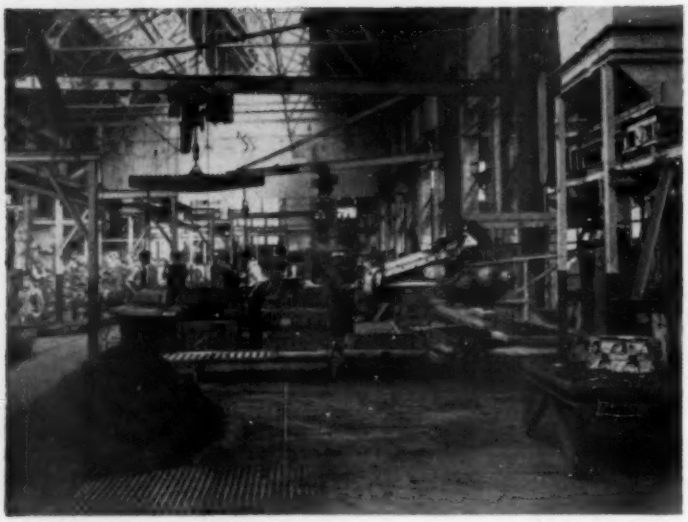
The Group has four large foundries. The selection of which of these are to be toured by members of the Institute of British Foundrymen and the route to be followed will depend on the time available, but it is almost certain that the visitors will have a sight of the Group's new foundry—an exterior view of which is illustrated at the head of this article—which is shortly to come into production.

Associated Electrical Industries (Manchester), Limited

The Trafford Park works of AEI (Manchester), Limited, was set up more than 60 years' ago by the American industrialist, George Westinghouse (the inventor of railway air-brakes), who had already established the Westinghouse Electric & Manufacturing Company at Pittsburgh, Pennsylvania, USA. To-day the works employs some 21,500 employees and covers an area of 148 acres. Power required in the works is supplied by 9,000 electric motors, the average daytime factory load being of the order of 12,500 kw. Materials and finished products are handled by 9,000 electric cranes and throughout the works and enclosed land there are 9½ miles of standard-gauge railway.

Foundries

The AEI foundries, which produce castings both



Section of the mechanized plant in the AEI Manchester non-ferrous foundry, showing the sand-rammer and part of the sand system (on the right).

in iron and non-ferrous and weighing from a few ounces to 30 to 40 tons, cover a total area of 212,913 sq. ft. The main foundry building is 576-ft. long and 310-ft. wide and is divided into five bays, two of which were lengthened to 77 ft. in 1920. The centre bay is 80-ft. wide by 55-ft. high to the crane track, and ventilation is provided in the apex of the roof along its whole length. The foundry for non-ferrous castings is a separate section in the north-west of the main building. Mechanization has eliminated much of the arduous nature of foundrywork and concrete floors, gangways, and air-purifying installations have reduced grimy and dusty working conditions to a minimum.

Features worthy of note in the AEI foundries include wide and well-planned gangways; fume-removal plant at knockout points in the mechanized section and at the melting plants in the non-ferrous foundry; stripping room for the breakdown of loam moulds; Hydroblasts in the dressing shops, enabling castings to be cored and grids reclaimed with none of the usual dust and dirty work usually involved; water-cooled spark arrestor with full automatic ph control fitted to five cupolas, and fluorescent lighting where advantageous.

The foundries are served by 15 overhead cranes, ranging in capacity from one to 50 tons, and 28 jib cranes. Equipment installed in the iron foundry includes 60 moulding machines, nine cupolas (ranging in size from 28 to 72 in. and with a total melting capacity of 48 tons per hr.), 10 gas-fired drying stoves and a stress-relieving oven for large castings.

Other Sections

The loose-pattern section is located in the centre bay and here large castings over a wide range of weights are produced, nine large moulding pits being provided to accommodate them. At the south end of the bay is the dressing shop, equipped with a Hydroblast in which heavy castings are subjected to high-pressure jets of water. The Hydroblast is divided into two sections, one containing a turn-table on which several castings are placed before washing starts. The medium and smaller castings are dressed in one of the extension bays which also contains a Hydroblast unit.

The moulding sections, where repetition work is carried out, have been mechanized. The use of several independent units obviates the necessity of shutting down the whole plant in case of breakdown, and the equipment installed includes both the straight-draw and roll-over types of jolt/squeeze machines and sandslingers for ramming large moulds. Sand-conditioning plant is also installed and fume-extraction plant at the knockout point removes 5,000 cu. ft. per min.

In the coreshop, many changes have taken place with the introduction of air-setting binders and these have resulted in a superior finish, more accurate cores and a quicker turn-round time, particularly when the reduced soaking time is taken into account. Use of the binders has also been extended to moulding.

In the paint shop, water-spray booths are employed for removing paint fumes from the atmosphere. After painting, the castings are fed by roller conveyor through the drying cycle and direct to transport for shipping, special containers being provided for the movement of castings, so that there is as little manhandling as possible.

The patternshop is well equipped with the latest wood and metal working tools and the building is airy and has good natural light. In addition to the chemical and metallurgical laboratories in the company's main research department, a test room is also provided for the control of the various materials used in the foundry.

Non-ferrous Foundry

In the company's non-ferrous foundry, the melting plant (consisting of pit-fired and oil-fired tilting crucible furnaces) is designed to enable the whole of the melting operations to be carried out in a healthy atmosphere, cool fresh air being constantly supplied and exhausted at the rear of the melting plant. Mechanized plant here includes a sand-rammer, pressure-die-casting machines for aluminium, brass and mazak, and equipment is also installed for the making of gravity dies in a special die-casting section.

Education Facilities

Metropolitan-Vickers was one of the first engineering firms to provide educational facilities for its apprentices. The works school was first opened in 1914, the present building (built in 1939) including classrooms and a well-equipped gymnasium. Classes are held in the day and during the evening and the curriculum covers a wide range of technical, commercial, linguistic and recreational subjects. The apprentice training school is a two-storey building and on the ground floor basic training in most of the skilled trades is given, the top floor being used for training girls in shorthand and typewriting. The training school has its own kitchens and canteen, medical centre and recreational rooms and, at the present time, there are 1,220 apprentices for training in professional engineering and 1,175 craft apprentices.

Other amenities include, for the main works, a canteen which serves 5,500 main meals, 3,500 light meals and 5,000 beverages daily.

Henry Wallwork & Company, Limited

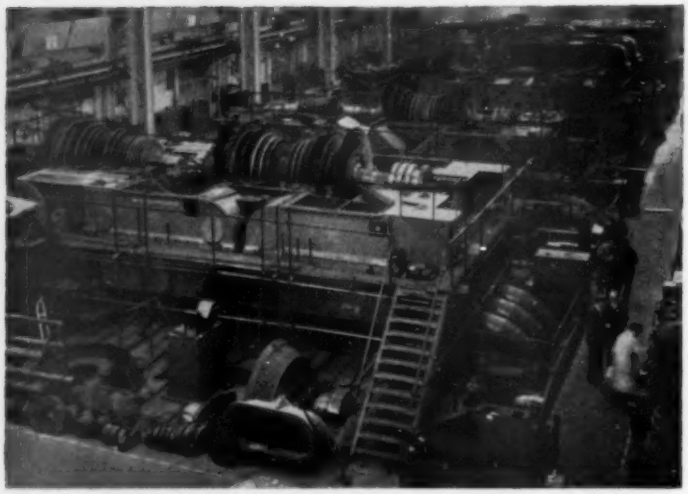
The ironfounding and engineering business of Henry Wallwork & Company, Limited, has been carried on at the present site for over 100 years. Originally formed as a small general engineering works with premises in Rochdale Road in 1856, a move was made to the Union Bridge premises in 1860 about which time ironfounding was added to the company's activities. During the past century, therefore, the company has been continuously engaged in the ironfounding business, which until the late 1930s had developed steadily along jobbing and semi-mechanized methods.

In 1937, the first mechanized moulding unit, serviced by a sand-preparation and -handling plant and two 30-cwt.-per-hour cupolas, was installed for the production of hydraulic pipe-joints. This plant is still in use, and is currently operating at a level of output of approximately 60 tons of castings per week which are produced on two 42-hour week shifts, using three out of four pairs of pneumatic jolt/squeeze/pin-lift moulding machines with box sizes varying from 16 by 14 by 4 in. up to 25 by 21 by 4 in.

Mechanized Foundry

In keeping with the company's policy of developing a flexible repetition foundry to produce top-quality general-engineering castings in high-duty irons, a further programme of expansion and reorganization was undertaken in 1949 with the installation of a second mechanized moulding unit, with a self-contained sand-handling plant capable of processing 20 tons of sand per hour, and a melting plant consisting of three, 5-ton-per-hour cupolas—all arranged for skip-hoist charging. Known within the works as No. 2 Plant, this comprises five pairs of moulding machines, three pairs of which are the jolt/squeeze/roll-over type confined to making moulds in green-sand, in a range of boxes up to a maximum size of 33 by 27 by 12 in. parts. The other two pairs of moulding machines are jolt/squeeze/pin-lift units, producing moulds which can be taken from the machines and closed by hand. All the moulds are closed on gravity roller conveyor, and thence are transferred for casting to individual bogies topped with gravity rollers, running on a simple rail track. Movement of the bogies along the track circuit is accomplished by "shunting" with a Brush battery-operated truck. There are three other semi-

Main bay of the AEI Manchester iron foundry where large castings up to 64 tons are made.



Large turbines on the test-beds in one of the main manufacturing aisles at AEI Trafford Park works.

mechanized moulding units in the foundry, each comprising two pairs of jolt/squeeze/pin-lift moulding machines serviced by batch sand from stillages, and simple runs of gravity roller conveyor. Two of these units are producing moulds which are all handled manually with a maximum box-part size of 18 by 16 by 6 in., and the third unit is equipped with air-hoist tackle for closing operations which involve heavier boxes up to 33-in. dia. by 6-in. deep parts. In 1950 work-study was introduced throughout the foundry with a view to increasing productivity and greater machine utilization, and to-day, this system is fully operative in all departments of the works, and is accepted alike by employer and employee as a rational basis for all work and operations which can be readily measured for payment by results.

Base of the recently-installed hot-blast cupola at Henry Wallwork & Company, Limited, showing continuous tapping through a Freier Grunder system.

Core-shop

The foundry is serviced by a central coremaking department. Most of the larger cores are produced on Hansburg and Jackman coreshooting machines, where the preponderance of the cores are made in CO_2 Process-sand. Smaller cores for the most part in oilsand, are made by means of Ronceray bench-type coreblowing machines. A pendulum conveyor system transfers all cores from the coremaking stations and benches to either spray-blacking locations, or to gas-fired vertical-continuous Acme core ovens. The pendulum conveyor is also adapted for carrying mixed sand from the core sand mixers to the benches and blowing machines.

Dressing Shop

This follows a conventional pattern, where all castings prior to being dressed are either shot-blasted in Wheelabrator barrel machines or, receive before shotblasting a rumbling-barrel treatment. The hydraulic-pipe-joint castings are also inspected and gauged in this department before being dipped in bituminous solution, which after being allowed to air dry are assembled as a complete joint consisting of two flange castings and one collar casting, before being ready for despatch to the customer. Rough inspection of other castings is of course also carried out in the dressing shop, but the final inspection stages are done in the warehouse, adjacent to the fettling department.

Patternshop

During the past year a programme of modernization and the complete renewal of machinery in this department has been made, and, with the exception of some precision-milling machine tools which have yet to be installed, the programme is now complete, with the result that the company have been able to undertake an ever-increasing amount of patternmaking for other foundries. Wood patterns up to a maximum size of approximately 20 by 10 by 5 ft. can be handled. In the course of the past few years a considerable ex-

pertise has been built up around the production of resin patterns and press blocks, and there is a separate section of the department engaged solely upon this specialized class of work. A high proportion of the patterns used in the company's own foundries are made in this shop, and these include finely-machined iron and bronze patterns and coreboxes, and large pressure-cast light-alloy patterns for use on the roll-over moulding machines. A considerable volume of work is accepted for fully-machined patterns and coreboxes, usually in aluminium/bronze, for the shell moulding and core-making processes.

Hot-blast Cupolas

In order to keep abreast of the most-modern economic and technical developments, a twin hot-blast cupola plant was installed about a year ago. Based on the CTIF Ulmer recuperative principle for the utilization of melting a high proportion of steel scrap and foundry return charges on a 55 to 45 per cent. basis respectively with a 17 per cent. by weight coke charge. Rated at 6 to 7 tons per hour with an operating recuperative temperature of between 450 and 500 deg. C., and arranged for continuous tapping with an adaptation of the Freier Grunder metal/slag separation system, the temperature of metal at the spout is 1,550 to 1,600 deg. C. Certain modifications are now being carried out on this plant and for the time being it is being worked with cold blast. The works metallurgical and chemical laboratory is well equipped, and a high degree of technical control is exercised throughout the works.

Linotype & Machinery, Limited

Linotype & Machinery, Limited, Altrincham, Cheshire, is an address known to printers all over the world. The factory, employing over 1,500 workers, is one of the largest of its kind in Great Britain and has been producing printers' machinery of the highest quality for over 60 years.

There are three principal products: "Linotype" composing machines, "Miehle" and "L&M" printing presses, and "Autoplate" stereo-casting machinery. Foundrymen will be interested to learn that both the Linotype and the Autoplate may be likened to specialized die-casting machines. The Lintoype is named after the end-product which it produces—cast lines of type. Each machine is equipped with magazines containing sets of brass matrices (*i.e.*, moulds) of printing characters, and these are assembled in lines, complete with adjustable spaces, by the operation of a keyboard similar to that of a typewriter. When a line is complete, it is moved across to the casting side of the machine, where it is cast in type-metal, an alloy of lead, tin, and antimony. After casting, the matrices are automatically re-distributed to their original positions in the magazine.

Letterpress

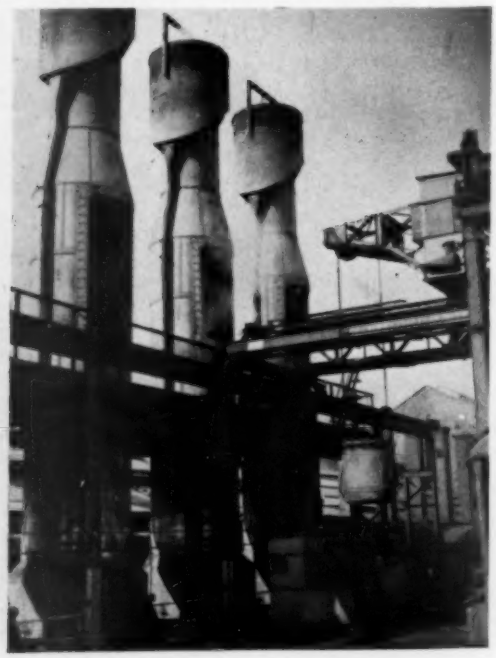
The Linotype was invented in 1886 by an

General view of the patternshop of Henry Wallwork & Company, Limited.

Hand shanking taking place in the brass-shop foundry of Linotype and Machinery, Limited.

American of German origin named Ottmar Mergenthaler. The first British Linotypes were manufactured in the 1890s by the Linotype Company, which in 1903 joined forces with the Machinery Trust, manufacturers of printing presses, to form Linotype & Machinery, Limited. Printing presses manufactured by L&M are all letterpress cylinder machines, used mainly for printing books and colour work such as advertising brochures. Their operating speeds vary, according to the size of the press, from about 1,500 to 3,500 impressions per hour.

Of the six cupolas in operation at the British Railways Horwich Locomotive Work's mechanized foundry, three have a capacity of 8 tons per hour and three of 20 tons. Charging operations can be seen here in progress on one of the latter.



Newspapers

The third group of L&M products, Autoplate machines, are used in the "foundries" of newspaper printing plants. Pages of type and blocks are "made up" in newspaper composing rooms, and have to be converted into curved plates for printing on rotary presses. The Autoplate produces these curved plates, from papier-mâché moulds. The fastest Autoplate machine, the Automatic, casts four curved plates per minute from one mould.

The manufacture of matrices for Linotype machines is another important branch of the firm's activities. A printing character begins as a large-scale drawing, which is then cut out in brass as a "pattern" for the punch-cutter. A punch is cut in steel, and this is pressed into the matrix, all being operations requiring a high degree of precision.

Foundry Section

The company has its own foundry (under the supervision of Mr. T. Nancollas), which produces nearly all the castings used in the manufacture of Linotypes, L&M presses and Autoplate machinery. The main part of the foundry was built in 1897. It was thought at the time the building would be large enough to fulfil the company's requirements of grey-iron castings; since that time, however, the company has grown considerably and other adjoining buildings have been annexed to the main foundry for the manufacture of printing-machinery castings.

The foundry now consists of three sections, namely loose, plate and semi-mechanized. The first is chiefly responsible for the larger type of casting, namely cylinders, type beds, etc. These are made by the dry-sand method, using stoves made by Modern Furnaces & Stoves, Limited. Sand is mixed by a hopper-charged mill and distributed to various parts by drop-bottom skip. In this department there are two cupolas, one of which is of the balanced-blast type and metal produced is to BSS 1452/17. The largest casting in this section weighs 2 tons.

The plate foundry makes castings from metal plate patterns and wooden boards varying in weight

from a few pounds to 2 tons, the largest pattern board measuring 17-ft. long and the casting from it weighing 39 cwt.

The semi-mechanized foundry has four BIC straight-draw/squeeze moulding machines from which the small castings are produced to BSS 1452/12. A roller-conveyor track is laid down and the casting tracks are in line with an overhead monorail, from which is suspended a Roper ladle for pouring.

The fettling shop has a shot-blast room large enough to hold the largest casting, and a Centriblast machine for the smaller types. In view of the high quality required by the inspection department of the finished casting after machining, a rigid control is kept on all raw materials in a well-organized stockyard. Different grades of pig-iron and scrap are stocked in their own particular bins, and all metal is weighed before being charged into the cupola.

Cores are made from Congleton silica sand and bonded by cereal powder and resin. In view of the nature of the castings, this procedure is found to be most suitable in securing a good strip and breakdown. Shower baths are provided for all foundry personnel; these are situated at the entrance of the loose-pattern foundry. The total amount of castings required from the foundries is approximately 2,000 tons per annum.

Linotype & Machinery, Limited, is one of the oldest-established manufacturing firms in the Altrincham district and has an excellent record of labour-management relations, never having had a "private" strike at any time in its existence.

British Railways, Horwich Locomotive Works

An iron foundry has been in existence at Horwich since the works was built in 1886. Initially, this produced all the iron castings required in the building and repairing of steam locomotives and certain other railway requirements for the former Lancashire and Yorkshire Railway, and provided work for skilled and semi-skilled labour. In 1951, a mechanized foundry was introduced for the production of rail chairs, baseplates and brakeblocks to cater for a large proportion of the total British Railways requirements. In 1959, the LM Region of British Railways carried out a foundry rationalization by which all semi-skilled plate-moulding work was concentrated in the general foundry at Horwich, whilst the skilled loose-pattern work was transferred to Crewe. The output from the mechanized and general foundry together is of the order of 100,000 tons per year, the vast proportion of which comes from the mechanized plant.

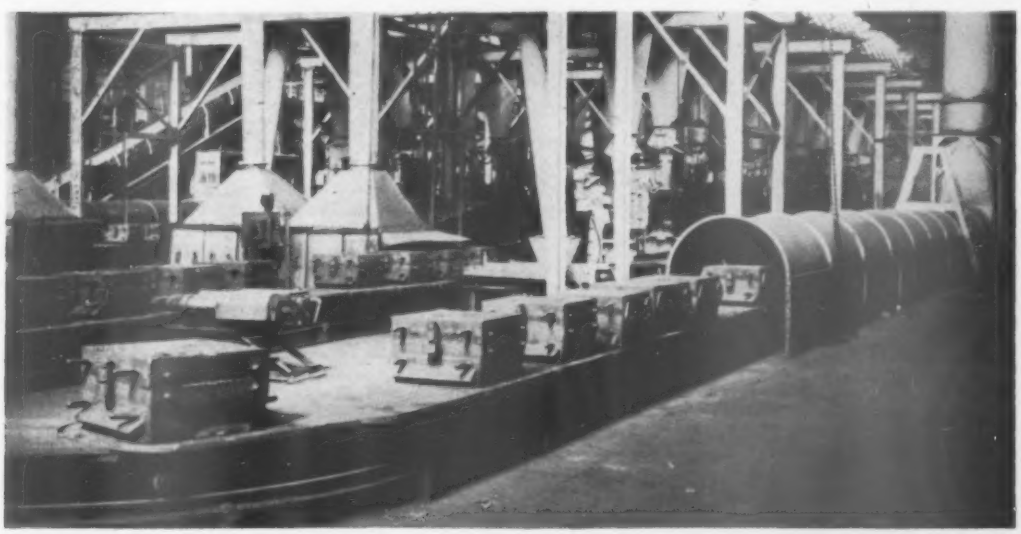
Mechanized Foundry

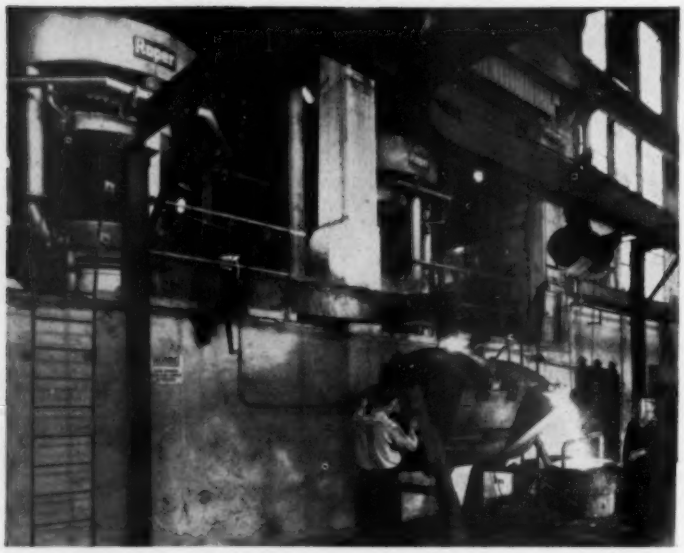
The mechanized foundry has a total covered area of approximately 67,000 sq. ft. and is divided into two sections, the chair plant and brakeblock plant, both served from a common stock gantry. A core section is also provided which produces cores for both plants and the foundry operates five days per week on two shifts.

Chair Plant

In the chair plant, charger cranes, using drop-bottom skips, feed three 20-ton-per-hr. cupolas, one

View of the chair plant in the mechanized foundry at British Railways Locomotive Works, showing fume ducting over the pallet-type mould conveyor and (left-centre) the ram for pushing the boxes onto one of the knockouts. (Mechanization by Foundry Equipment, Limited.)





Charging a ladle at the foundry of Gresham & Craven, Limited, from the three-ton-capacity receiver which services two water-cooled cold-blast cupolas.

of which is used on each shift. A ladle runway provides a continuous circuit from the 5-ton cupola receivers to the metal-pouring station on each mould conveyor. There are two pallet-type mould conveyors and each moulding unit consists of six pairs of machines, four pairs being in operation at any one time. A jolt/squeeze/roll-over machine is used for the bottom half of the mould and a straight squeeze machine for the top half of the mould. Three men operate each pair of machines and produce some 500 boxes per shift. Electro-magnetic vibrating knockouts are provided from which points the castings are conveyed to a bucket-type cooling conveyor. On return from the cooling conveyor after some four to five hours, the castings pass through shotblast machines to the hand-dressing stations and thence direct to the loading bay for despatch. The sand-reconditioning plant comprises a magnetic separator, rotary screen and two 30-ton-per-hr. continuous mills, and natural bonded sand is employed. The annual output of the chair plant is some 64,000 tons of rail chairs and baseplates.

View of the stockyard of Gresham & Craven, Limited's three-in-one foundry showing the compartmentalized scrap and raw-materials bunkers.

Brakeblock Plant

The brakeblock plant is similar in basic principles to the chair plant, but there is only one mould-conveyor track and five pairs of moulding machines. There are three 8-ton-per-hr. cupolas and only one 30-ton-per-hr. sand mill. Approximately 27,000 tons of a variety of cast-iron brakeblocks are produced per annum.

Core Section

In the core section, cores are produced by six coreshooting machines and are dried in two reverse-flow gas-fired core-drying ovens.

Cupolas

There are three 20-ton and three 8-ton-per-hr. cupolas at the Horwich works and these are being converted to hot-blast on the VEW system. The scheme has been justified on prospective coke and pig-iron savings; no increase of metal temperature is desired and the use of steel scrap is not envisaged initially as adequate supplies of cast-iron scrap are available.

General Foundry

The general foundry has a covered area of approximately 24,000 sq. ft. and is served by two 5-ton-per-hr. cupolas. The contour of the land is such that the raw materials can be unloaded direct on to the cupola-charging platform without the need for mechanized chargers. A large proportion of the output is manufactured using plate patterns and floor-moulding methods, but there are eight moulding machines in use of jolt, jolt/squeeze and jolt/squeeze/turnover types. The annual output is of the order of 7,000 tons, comprising locomotive firebars, wagon axleboxes, special rail-

chairs for points and crossings (which cannot be accommodated in the mechanized plant) and a variety of other requirements, ranging from 3 lb. to 3 cwt.

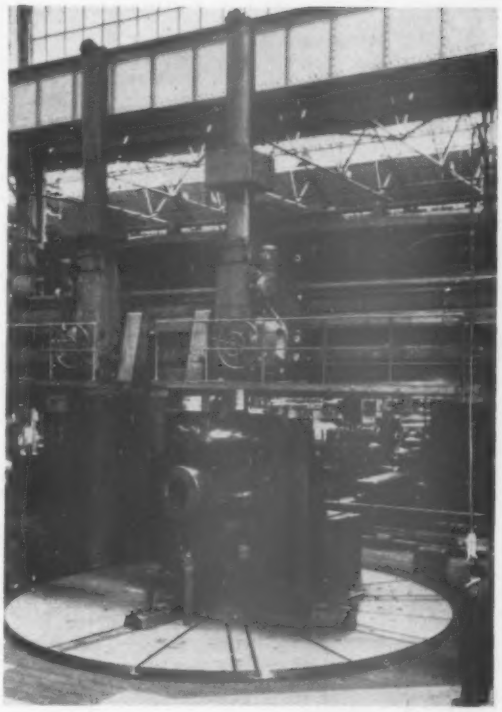
Gresham & Craven, Limited

In the foundry department of Gresham & Craven, Limited, are included three distinct sections all operating in the same building. They are comprised of a mechanized production unit, a section specializing in the making of small varied castings, and a separate foundry unit catering for non-ferrous demand only.

Mechanized Unit

The mechanized production unit occupies the biggest part of the floor area and comprises a bank of seven machines of the jolt/squeeze type, capable of producing a complete mould every minute; these are fed on to a moving conveyor to be taken past a pouring station and thence round to the shake-out point where the empty boxes are shunted back to the various machines. The castings at this point are hooked on to an overhead conveyor and transported via the outside of the building (to facilitate cooling). They are then brought back inside to the shotblasting unit and finally delivered to the fettling booths. The castings produced in this section are of the cylindrical type and weigh in the region of one cwt. each. They range from 15 to 21-in. dia. and are up to 22-in. deep.

The synthetic sand supplied in this department is fed from a single storage-hopper to a continuous mill where the necessary additions are made from mechanical hoppers. The sand is then elevated and passed through disintegrators to the overhead conveyor where it is ploughed into the hoppers above each machine. A small test station is situated above the mill area where tests are carried out every 10 minutes to ensure complete control.



Large vertical boring machine—one of the finished machine-tools produced by George Richards & Company, Limited.

Furnaces

The melting is carried out in two water-cooled, cold-blast cupolas, using the front-slagging technique. Feeding a receiver of three-tons capacity, the melting rate of these furnaces is six tons per hour and grey iron up to grade 17 is produced. Full instrumentation is incorporated to ensure best-possible results. The charging is mechanical, with materials first being loaded into a skip equipped with an automatic-

A Richards planing machine "in action." Castings up to 30 tons weight are produced in the foundries of this Altrincham firm.

weighing device which tilts into a drop-bottom bucket. This is then raised to the level of the charging door. A 30-cwt. mains-frequency furnace is in operation on the reclamation of borings and steel off-cuts. Its output in the form of pig-iron is used for re-charging into the cupolas.

Other Sections

Embodied in the general foundry the small moulding section produces light castings up to a few pounds in weight, and varying in shape and size. The largest moulding box utilized here is an 18 by 12-in. The metal used is mainly grey iron which is supplied from the cupolas or electric furnace. The non-ferrous unit caters for the production of all types of brass, bronze, aluminium and white-metal castings varying in weight from a few ounces to over one cwt. The supply of liquid metal is provided in this case by oil-fired tilting furnaces of four-cwt. capacity.

With regard to coring requirements the non-ferrous and small moulding sections are serviced by one coreshop using oil sand, CO_2 Process and shell-coreblowing techniques. In the mechanized unit, on the other hand, is incorporated its own core bench which uses the CO_2 Process. Quality-control is carried out by the laboratory staff and involves chemical analysis, physical testing, and metallographic checks on samples of the metal in use in the foundries. Chill tests on the quality of cupola melts and control checks on the properties of moulding sands are an essential part of laboratory routine.

George Richards & Company, Limited

George Richards & Company, Limited, Broadheath, Altrincham, one of the works to be visited during the IBF National Works Visits Day, are manufacturers of machine-tools, their production consisting principally in a wide range of horizontal and vertical boring mills and large planing machines. The company has occupied its present site since 1912; the present foundry was erected in 1920 and further extended in 1953 to meet the requirements for grey-iron castings for the company's machine-shop.

Works Set-up

The foundry building is 500-ft. long, the main bay being 50-ft. wide, and served by one 30-, one 20- and two 10-ton cranes. The large castings made here—up to 30 tons individual weight—are produced by floor-moulding methods. A side bay, 40-ft. wide, is served by one 2- and one 1-ton crane and here smaller castings are made, both by machine- and hand-moulding methods. The other foundry bay, also 40-ft. wide, and served by three 5-ton cranes, utilizes a mobile sandslinger and produces medium size castings. The furnace installation consists of three cold-blast hand-charged cupolas of three-, five- and seven-tons per hr. melting capacity. Grey irons to BS 1452, grades 12, 14, 17 and 20 are produced from charges carrying a high steel- and low-phosphorus content, the metal being inoculated at the spout.

Raw materials are stored adjacent and parallel to the foundry building which is served by both road and rail transport. Wide use is made of air-setting oils for coremaking and sea sand is dried, cooled and delivered pneumatically to storage hoppers, measured to the mixers and then the mixed material is distributed to the coremakers. Natural-bonded red facing sands are used exclusively, with the addition of coal-dust, pelleted pitch, wood-flour, peat, clays, cereals and processed horse-manure, to suit the type and weight of work being produced. Some CO_2-Process moulding is done as an alternative to dried-sand for some of the smaller moulds.

At George Richards, moulds and cores are dried in large gas-fired stoves of the recirculating type and all ladles are preheated by oil-fired burners. A Hydroblast plant is installed to clean the large castings and the fettling shop is equipped with both pneumatic and Hicycle equipment, in conjunction with low-volume, high-velocity dust-extraction plant.

General

The good quality of the large castings produced is a result of the employment of highly-skilled foundry personnel, most of whom are ex-apprentices with records of long service with the firm. An intensive apprentice-training scheme is in being, as is evidenced by the quality and quantity of apprentices employed, and it is interesting to note that the firm has a waiting list for apprentices to the foundry. Despite the age of the building, the working conditions in the foundry are good; there is efficient lighting, heating and ventilation, and pit-head-type showerbaths, lockers and changing facilities are also provided.

George Richards & Company are closely associated with Tilghman's, Limited, both companies being members of the Staveley Industries Group.

Erratum—Craven Brothers (Manchester), Limited

Attention has been drawn to an unfortunate substitution at line 13 on page 449 of last week's JOURNAL carrying the account of the set-up of Craven Brothers (Manchester), Limited. The line and its continuation should read ". . . at Reddish. This necessitated the sale of the old-fashioned Craven crane business and immediate extensions to plant and buildings." The correction is necessary so as to dispel any illusion that the firm still has a crane department.

THE FIRST "Course in Applied Pneumatics" was held at Farnham, Surrey, from October 2 to 6. The course, sponsored by the *Journal of Applied Pneumatics*, the house journal of Martonair, Limited, was attended by 20 students from all parts of the country, who heard lectures upon compressed air theory, circuit design, mechanism and machine design, equipment design, maintenance, hydro-pneumatics and other topics. A works visit and practical sessions were included. Further courses are being held on October 30 and March 5 and 26, 1962; vacancies exist on a course commencing April 16, 1962.

Second Hungarian Foundry Congress

International Participation at Budapest, September 17 to 22

The second Hungarian Foundry Congress was held in Budapest from September 17 to 22; some 350 delegates attended, the majority coming from the Hungarian foundry industry although there were a moderate number of delegates from abroad, particularly from Poland, Czechoslovakia, and Eastern Germany. Prior to the official opening, a reception was held on the Sunday evening for foreign delegates which was a delightful way for them to meet their charming hosts.

The conference was formally opened on the Monday with a speech by Mr. Janos Csergo, the Hungarian Minister for Foundries and Machine Construction; in his talk, he reviewed progress in the first five-year plan and outlined aims for the second five-year period of which one year has now elapsed. The ambitious targets, particularly for the steelmaking and foundry industries, indeed sounded most impressive. The programme of technical lectures then continued for three days, divided after the opening day into pairs of simultaneous sessions.

Technical Sessions

It would be difficult in a short report to do justice to the wide range of topics covered in the lectures, many of which showed the rapid and considerable technological development of the Hungarian foundry industry since the end of the war and of the substantial research effort of both their ferrous and non-ferrous centres which were visited later during the Congress. Amongst the proceedings, a lecture and film (with Hungarian commentary) was presented by Dr. D. V. Atterton of Foseco International, Limited, on the application of mouldable exothermic materials for the feeding and padding of castings. This lecture, which was accompanied by a sentence by sentence translation into Hungarian, was well received and stimulated much interest. Another contributor from outside Hungary was Mr. G. Schneider of Roper Werke, in West Germany, who presented a paper on recent developments with a core-shooter. In particular, he dealt with the utilization of this machine for the production of cores by the CO_2 Process. This lecture was in many ways complementary to one presented by Mr. I. Felhosi which described the application of a core-shooter in the iron and steel foundries of the large Csepel works.

Several papers were presented on methods of increasing productivity within the foundry and

Part of the audience at one of the sessions during last month's Congress of Hungarian foundrymen in Budapest. Second from left in the second row is Dr. D. V. Atterton, from England, who presented a paper on exothemic aids to casting quality. On his right is Mr. E. Chapo, of the Hungarian Research Institute, who gave a paper on malleable iron.

especially dealing with foundry layout. Mr. O. Szenes and his co-authors gave an interesting review of modern Hungarian foundry installations and the modernization of the machine-moulding shop in the ferrous foundries of Csepel was described in detail by Mr. L. Kalman and Mr. I. Szilagvi.

Other Topics

One session was virtually devoted to the hot-blast cupola. A theoretical study of the heat balance of the cupola by Mr. F. Varga opened this session and this was followed by two excellent papers by Mr. D. Wortmann and by Mr. E. Voros and Mr. F. Varga which described practical experiences in the operation of hot-blast cupolas. Prof. Chudzikiewiez of the Technical High School at Szczecin, in Poland, presented a technical review of the hot-blast cupola and described result with ten units in operation in Polish foundries.

The CO_2 Process was covered by two papers. Mr. T. Budinszky described a series of experiments to evaluate and compare Hungarian and foreign silicates, the investigation being confined to sodium silicates with a ratio of $SiO_2 : Na_2O$ between 2.6 and 2.8. Mr. O. Racz dealt with the CO_2 Process for the production of a range of iron and steel castings, dealing with the techniques employed to ensure good surface finish and collapsibility.

A most interesting lecture was presented by Mr. E. Chapo on improving the quality of malleable iron which described the results of his investigations carried out in the Ferrous Research Institute and dealt in particular with the influence of trace elements.

Several lectures were presented on non-ferrous topics; Mr. A. Balevsky and Mr. I. Nikolov described a process for casting under pressure which has evidently been patented in Bulgaria, though from the detail given, the process did not seem particularly novel. Mr. H. Rogoss and Mr. I. Hainke described an investigation into the influence of non-metallic inclusions on the properties of aluminium castings.

As on the occasion of the first Congress, the lectures were all delivered in the premises of the Hungarian Mining and Metallurgical Society of which the foundrymen are a constituent section. Of incidental interest, this impressive building was the old Budapest Stock Exchange. Arranged in the main conference hall there was an impressive exhibition illustrating the production of various Hungarian foundries; exhibits ranged from actual castings to photographs and included epoxy-resin patterns, a wide range of shell moulds and cores—substantially thicker in section than those produced in the United Kingdom—several large CO_2 cores and a wide range of gravity- and pressure-die-cast aluminium castings. A most interesting exhibit was a gravity-die which had been used as part of an experimental study for the ultimate production of automobile cylinder-blocks in aluminium by semi-gravity die-castings.

On the Wednesday evening a most enjoyable dinner was held, to which all foreign delegates were invited. A short informal speech was made on this occasion by Mr. Laszlo Safar, the Congress chairman; he certainly expressed the views of all delegates in stating how readily foundrymen overcame the language barrier when discussing technical problems.

Works Visits

For the remaining two days of the Congress, an interesting programme of works visits had been arranged. On Thursday, one party paid a visit to the non-ferrous foundry of Csepel and to the Ferrous and Non-Ferrous Research Institute. The Csepel foundry is part of a large group employing some 40,000 and making a wide range of products such as motor-bicycles, tractors, sewing machines, propellers and a very wide variety of engines. This foundry is undergoing a most ambitious programme of modernization with the predominant aim of increasing the level of mechanization. Visitors were taken first to the aluminium sand, gravity- and pressure-die-casting foundries. This section produces all of its own ingots from both primary aluminium and returns. A somewhat surprising features was that the metal is ingotted and remelted rather than being conveyed directly to moulds or bale-out furnaces. In the sand foundry, a very wide range of castings was being produced, the general quality of which was impressive; one item of particular interest was a 12-cylinder diesel-engine of 520 kgm. finished weight, produced in Silumin alloy.

In the gravity shop, a substantial proportion of the production consists of petrol- and diesel-engine pistons; a considerable amount of automation on die operation had been introduced and the standard of safety precaution was good.

In the copper-base foundry, the predominant moulding process was either greensand or CO_2/sodium-silicate. Currently, experiments were being carried out in the production of propellers by the latter process. It was particularly encouraging to see the extensive use of British made crucibles in this foundry.

The general impression which a visitor had during this short visit was of considerable efficiency at all levels, and of the production of a very wide range of castings of good quality under conditions at times of extreme difficulty, due to the current extensive alterations. The level of technical control was good and the enthusiasm of the metallurgical staff quite out of the ordinary.

The writer's party was then taken on a tour of the Ferrous and Non-Ferrous Institute. This is a very well equipped and staffed research organization which is divided into various departments, including foundry, wrought non-ferrous metals, welding, powder metallurgy, ore dressing, mechanical testing, optical and electron microscopy, gas in metals, etc. There is a total staff of some 380 with approximately 130 at graduate level. Equipment in the melting section, including the foundry, consisted of a 12-in. dia. cupola, 100-kg. indirect-

arc steel-melting furnace, a 200-kg. direct-arc furnace and a 25-kg. vacuum furnace. There were two continuous-casting plants; that for light alloys was very well automated and was capable of producing production-size billets and slabs. In the ferrous foundry experiments had been carried out on the continuous casting of iron pipes although the comment was made that the economics of this were doubtful. Of current foundry research projects, the work on internal stress and shrinkage in grey iron was of particular interest and merit, as was the detailed investigation being carried out on the annealing of malleable iron.

In other departments, visitors had an opportunity of seeing many items of great metallurgical interest. For example, there was a pilot plant for producing sponge iron, a powder-metallurgy section dealing predominantly with the production of alumina cutting tools, a plant for the beneficiation of ores containing approximately 20 per cent. iron, an excellent isotope section, and an extremely well-equipped gas-in-metals laboratory, which served both the ferrous and non-ferrous departments.

Friday's Excursion

Finally, on the Friday, visitors were taken by coach to the Lenin Kohaszati Muvek steelworks near to Miskolc. This is a very large integrated steelworks employing some 40,000 workers; in addition, there is a large steel foundry said to be producing some 1,400 tons of finished castings per month.

The factory is on the site of an old iron works built in 1770 and a substantial amount of rebuilding has taken place quite recently, since a substantial part of the factory was destroyed in a large-scale bombing attack in September, 1944. Modern blast-furnaces have been installed, including one of 915 cu. yd. capacity. A slag-granulating plant, an oxygen plant, and an ore-sintering plant have also been erected within comparatively recent times. Also, as part of the modernization programme, the old 30 to 40-ton open-hearth furnaces have been replaced by units of between 80 to 180 tons capacity, which have increased output threefold.

This works produces a very wide range of steels, including high-speed tool-steels, heavy-alloy steels and stainless, acid-resistant and heat-resistant steels. A semi-continuous casting plant has also been installed recently although this was not seen during the visit, due to shortage of time.

In the steel foundry, castings from about 300 lb. up to 30 tons in weight are produced in both highly alloyed and plain carbon steels. In the moulding bay the two predominant sand mixes were silicate-sand/bentonite and a chrome/magnesite material. The sizes of feeder-head employed appeared extremely large and yields on many castings wre probably only in the 30 to 40 per cent. range. Possibly as a consequence of this, there appeared to be a considerable "bottleneck" in the fettling shop. In the latter, there was an extremely modern Hydroblast installation, where about a dozen jets could be played upon the casting, as viewed through numerous windows.

In this neighbourhood, the visitors were also taken to a most delightful museum where there were models showing the evolution of smelting and foundry techniques throughout the world; in addition, on show were operational models of the modern plant installed in the factory which had been toured.

On the return journey to Budapest, delegates were taken to a large wine-cellar in the ancient town of Eger; this provided a most pleasant evening's relaxation and was a very happy way of concluding the Congress.

Steel and Pig-iron in September

Steel production in September dropped by 17 per cent., compared with output for September, 1960, the Iron and Steel Board stated Thursday, October 12. Although the weekly average rate in September recovered to 400,200 tons, compared with 338,400 tons a week in August, it represents the use of only 77 per cent. of capacity.

The board points out that the fall in steel production during the course of 1961 has followed broadly the same course as in 1958, the last year when activity in the industry declined. For the first three quarters of 1958 the percentage changes compared with 1957 were down by 1, 10, and 16 per cent., respectively. So far this year the quarterly changes have been down by 0.5, 2, and 14 per cent., respectively. As in 1958, the reduction appears to be caused largely by a reversal of the stock increase which took place in the previous year. In the third quarter of last year consumers' and merchants' stocks increased by 340,000 ingot tons, whereas in the third quarter of this year there are indications that stocks have been reduced substantially.

Latest pig-iron and steel output figures (in tons), with the corresponding 1960 returns, are shown in the following table:—

Period.	Pig-iron.		Steel ingots and castings.	
	Weekly average.	Annual rate.	Weekly average.	Annual rate.
1961—July	276,600	14,381,000	380,200	19,771,000
August ..	264,900	13,774,000	338,400	17,595,000
September ..	260,700	13,554,000	400,200	20,811,000
1st 9 months	292,500	15,211,000	436,700	22,706,000
1960—July	288,900	15,024,000	391,400	20,355,000
August ..	291,400	15,152,000	422,900	21,988,000
September ..	305,800	15,900,000	481,000	25,012,000
1st 9 months	300,000	15,611,000	461,300	23,987,000

Development at Port Glasgow

A new £250,000 factory of Aircraft-Marine Products (Great Britain), Limited, was opened recently at Port Glasgow by the Secretary of State for Scotland, Mr. John S. Maclay. He said that it was an expansion by a fairly recent newcomer to Scotland engaged in one of the new science-based industries which they had all been so anxious to see established as a means of modernising the industrial structure of Scotland. An additional 130 jobs will be provided at the factory, which has an area of 60,000 sq. ft. It will enable the company to increase production of terminals, connectors and associated products.

John Harper's One-day Conference

A "highlight" of this year's One-day Conference, held last Wednesday by John Harper & Company, Limited, the Willenhall ironfounders, was an account by Mr. M. H. Harper, B.A., of his experiences of business education in the United States, following completion by him of a two-year course at Harvard University School of Business Administration.

The Conference is organized to bring together representatives of customer firms, a cross-section from general industry, the firm's bankers, stockbrokers, advertisers, accountants, solicitors, etc., and members of the Press, to hear of recent developments in the works, policy changes, manufacturing trends and outlook. As a means of cementing cordial relations between these sections and of putting the firm's point of view, the event has much to commend it. It was staged in the works' social club and presided over by Mr. Wilfrid H. Harper, the present managing director, the morning being given over to papers and discussions and the afternoon to a comprehensive tour of the works. At luncheon in between, the 120 or more delegates were guests of the company. Notable amongst those attending were the American Consul and vice-Consul for Birmingham and the chairman of the Willenhall Urban District Council, Councillor E. J. Clarke. Unfortunately, at short notice, Mr. N. R. Rennie of the Board of Trade was prevented from being present.

Morning Proceedings

Initially, in welcoming the delegates, Mr. Harper gave a very short history of the firm saying that it had been established in 1790 for the production of spring latches, padlocks and keys for which even then the whole district was world-renowned. At Harper's, production in later years had switched to oil lamps and all sorts of ornamental iron castings and before the end of the 19th century the first "Beatrice" oil-heaters had been made. It appears that a similar design is still being produced to-day and, strangely, some are currently being exported. Coming up to present times, Mr. Wilfrid said that the firm was now well-established as general high-duty repetition ironfounders had on the finished-goods side recently entered the central-heating market. Throughout, it was a story of "moving with the times" and that the future is looked forward to with confidence was evinced by the chairman's reference to the Common Market where he said Harper's were already exporting finished goods and increases were expected. Furthermore, he said, their firm was one of the few already exporting raw castings (particularly typewriter components) to parts of Europe and the US and increased business was expected in this sphere also.

Next on the programme was a talk by Mr. J. E. Spear, foundry director of the firm, on the subject of "Labour Relations." Explaining that with 1,400 employed, it was perhaps difficult to describe Harper's as a family business, he said that nevertheless there was a family spirit permeating the firm which played an intangible—but very real—part in securing good employer/employee relations. The "keystone" was the foreman, who at Harper's was entirely responsible for hiring and firing—jobs often nowadays relegated to personnel managers. It was the foreman's job also to agree piecework prices with individuals, based on time-studies. Four factors, Mr. Spear said, were of major importance to employees in the works:—(1) Wages—this was the only yardstick by which a man could measure his worth to the firm and his particular place in it; (2) recognition of a man's individuality. Here, the firm's "family" background, where for a great number of years every man was personally known by the managing director, was of tremendous significance. It was a much nicer way, he said, to refer to individuals, for example, as *Mr.* A. E. Smith instead of Smith, A. E. During the short life to-date of the firm's suggestion scheme, the highest award so far had been £144 and there had been two awards each of £50. The speaker's third and fourth points referred to working conditions (seemingly regarded by employees as secondary in importance to cash) and amenities. On the incidence of coloured workers, he said 15 per cent. of Harper's foundry labour at present came from abroad and included many nationalities. These men were doing an excellent job of work and got the same rate as local men. As an example of the good relations here with coloured workers, Mr. Spear mentioned that recently the Indian labour in the works had subscribed amongst themselves for a two-way air ticket for their labour gang foreman so that he could pay a holiday visit to their own country to see what conditions were like there. A scheme much appreciated by retired workpeople is a Pensioners' Club for which a special night is set aside monthly in the social club, the gathering being attended by both directors and staff.

American Business Training

Introducing his son, Mr. Malcolm Harper for the talk on the American business-education set-up, the chairman said he was the sixth generation of the Harper family who had entered the business. In rapid style, Mr. Malcolm then gave a survey of and commentary on the course he had just completed at Harvard. First, he explained the US attitude, where business training was accepted as a quite normal phase of education and where he was surprised initially at the tempo of study, some 10 to 14 hours per day being put in by some students. There was little lecturing, most of the class study being by the "case" system, where groups had to examine a given situation in a manufacturing or supply firm and put forward solutions to problems of administration, costing or management.

An underlying theme of the course had been to make graduates aware of the trends and needs of society and make them almost "disciples" of a new order of business administration. The attitude to accountancy, for example, was a radical one—it was to *use* figures and not merely to collect them. In labour relations, for example, giving personnel the opportunity to communicate had been proved a valuable aid to productivity. In company finance, the statement that "unused reserves amounted to almost robbery of shareholders" had been an attitutude put forward. In his concluding sections, Mr. Harper stressed that throughout the course, despite an apparent contradiction of theme, the need to take in the human aspects of every situation was stressed.

The final paper of the morning was by Mr. P. Bell, the firm's design consultant, on the subject of "Industrial Design." Mr. Bell stressed the importance of teamwork in any approach to component or finished-product design, saying it was necessary to reconcile views of salesmen, producers, finishers and users. Only on an assessment of each design's worth and requirements as regards materials used and methods of production available was it possible to work out models acceptable for placing on the market. Of Harper's, Mr. Bell said in conclusion that it was a sign of enlightened management that after nearly 200 years' manufacturing, they were still prepared to accept outside ideas from people such as himself

and plan introduction of new lines and "new looks" for old ones. After a short period occupied by questions and answers, this closed the morning's proceedings.

The tour of the works during the afternoon was undertaken in small parties along with knowledgable guides drawn from senior staff. Both the Meehanite and grey-iron sections, melting shops, core departments, stores and all departments contributing to the production of finished goods, assembly and packaging were visited.

Shanks Iron Founders taken over

The National Steel Foundry (1914), Limited, of Leven, Fife, has taken over the firm of Shanks Iron Founders, Limited, Arbroath, Angus. Shanks Iron Founders, the only Scottish firm producing blackheart-malleable iron castings, is an associate firm of Alex. Shanks & Son, Limited. The latter company will continue under the present ownership, concentrating on general and agricultural engineering, with an employment of 170 men and nine women.

Chairman of both Shanks Iron Founders and Alex. Shanks & Son, the Hon. Alan Mackay, said: "My board of directors think that full development of the foundry should be in the hands of people who have larger and wider founding interests and connections than themselves. It is their intention to apply all their resources to developing and expanding their general engineering and agricultural business."

The National Steel Foundry, a subsidiary of Lake & Elliott, Limited, Braintree, Essex, intends continuing in Arbroath the production of blackheart-malleable and grey-iron castings and chilled-iron pulleys. Mr. J. S. McMillan, of the National Steel Foundry, is the general manager.

Film Review

Precision Casting at G.K.N. Research Laboratory, issued by Guest, Keen & Nettlefolds, Limited; a black and white film, running for 36 min.

Because this film covers a description of mould making for the Shaw, shell and CO_2 Processes under laboratory conditions, its appeal is somewhat restricted. It is, however, excellent for demonstrating basic principles for students, as the plant used is so simple that it makes it ideal for this purpose. Although rudimentary apparatus is shown, the lesson of control is emphasized, whilst the castings made are for production and not purely experimental. The best of the three sections shown is that of the Shaw Process because this aligns itself better with normal works practice.

British Display in Peru

The Board of Trade has provided a pavilion and organized a display there of British consumer and capital goods at the Second Pacific International Trade Fair, in Lima, Peru (October 12 to 29).

More than 70 British firms are exhibiting or are represented by agents in the display in the British Pavilion and its central courtyard. They are showing products ranging from marine diesel engines, mining equipment and contractors' plant to washing machines and refrigerators. A Tudor-style "pub," for which 20 British distillers are supplying drinks, and a cinema showing British trade films offer visitors some diversion and relaxation. Twenty-six countries are represented at this year's Fair.

Correspondence

To the Editor of the FOUNDRY TRADE JOURNAL

BRAKE-DRUM PROBLEM

SIR,—Since last week's hastily-written reply to "Drummer's" question in your issue of September 21, I have had a chance to re-read his letter. I note his reluctance to alter his running system because of its satisfactory performance for the general run of drum castings.

For the sake of other readers studying the problem, I would like to emphasize the critical nature of the conditions obtaining in this particular case. It may well be that other sizes and designs of drum castings do not react to the running system as does the one under review, although the danger is always there. To exaggerate an example for clarity: If the design being studied was altered by lifting the rib to form a flange at the open end, and the same runner positioned in the "drag" instead of the "cope" I am certain that the porosity would not occur. It may be sufficient, even with the present design, to reverse the runner to position it in the drag but this would have to be established by experiment. The great thing is to recognize and afterwards break up the "alliance" which is so favourable to this type of fault.

In a long association with foundry problems and design I have reached the conclusion that we foundrymen neglect to study sufficiently the design of castings *as cast*, as distinct from the picture presented by the drawing. Such additions as running and feeding systems, machining allowances, bosses and lugs for machining or jigging purposes, etc., can make a great difference to foundry "prognosis," particularly when dealing with the more recalcitrant materials. I suffered a good many headaches before I mastered this fundamental principle.—Yours, etc.,

W. H. BOND.

Sutton Coldfield.

British Aid to Indian College

British industry has provided over £250,000 towards the equipment of the Delhi College of Engineering and Technology, the foundation stone of which was laid by the Duke of Edinburgh in January, 1959. The British Government is providing some 15 professors over periods of five years and a number of additional services, while the Government of India is providing the buildings, all other staff, services, and locally available equipment. The first group of 150 students at the college are equally divided between the departments of civil, mechanical, electrical, chemical, engineering, and textile technology.

At a meeting last week at the headquarters of the Federation of British Industries in London, Mr. R. N. Dogra, principal of the college, gratefully acknowledged the generous help given by British industry in establishing the college.

AFS Students' Chapter

A new Student Chapter, the fifteenth to be chartered by the American Foundrymen's Society, was organized last August at General Motors Institute in Flint, Mich. Chartering of the Chapter was in connection with the Annual Student/Industry Night of the Foundrymen's Club, attended by high executives from all divisions of General Motors Corporation, headed by Mr. Harold G. Warner, vice-president and general manager of the Cadillac motor-car division. There are approximately 60 members of the new Chapter.

"Electricity in the Foundry"

Major C. R. Dibben, chairman of the Midland Regional Board for Industry, opened, on October 10, a two-day conference at Wolverhampton, convened by the Midlands Electricity Board, on the use of electricity in the foundry industry.

Major Dibben said that the conference took place against a background of an ever-increasing industrial interest in the greater use of electrical power. That interest had been encouraged by recent changes in the costs of alternative fuels and by the pressure of events in the foundry industry. The development of production techniques involved complex problems for management. To meet growing competition, not least in overseas markets, it had become urgent for British industry to seek ways of reducing costs, increasing productivity and achieving more efficient quality control. In pursuing this search, current developments in the efficient use of fuel were playing a valuable part.

Both ferrous and non-ferrous industries used electric furnaces widely, Major Dibben said. Electric-furnace output represented about 7 per cent. of the country's total to-day, but that figure was expected to rise to about 12 per cent. in the next three or four years. Furthermore, while electric furnaces had been used for many years for making special steels, there was a growing recognition of the possibilities of using larger electric furnaces for bulk steels. Current plans in the industry included the installation of furnaces up to a capacity of 100 tons.

On labour, Major Dibben said that the very considerable difficulty of attracting and retaining labour in the foundry industry was well known. In the last educational year at the North Staffordshire Technical College, for instance, nearly half the youths who started training for foundrywork had abandoned their studies after only seven weeks and by the end of the year fewer than a dozen of the entrants remained. The "green" labour problem was one which the industry had to solve if it was to recruit new craft skill to the trade.

Staveley Statement to Unions

After a meeting lasting one-and-a-half hours at Staveley Works, Chesterfield, last Friday, the following joint statement was issued: "At a meeting to-day, when representatives of the management of the Staveley Iron & Chemical Company, Limited, met officials from the National Union of General and Municipal Workers, the National Union of Blast Furnacemen, the Amalgamated Engineering Union, the Electrical Trades Union, the Amalgamated Union of Foundry Workers, the United Society of Boilermakers, and the Building Trades Unions, the union officials inquired what the management considered to be the future of the company. In reply, the deputy managing director, Mr. W. N. Menzies-Wilson, said that the future obviously depended upon market conditions prevailing at the time, but under present conditions there was no intention of closing down any further plant.

The company's spokesman also said that the intention of the original purchase of the company by Stewarts and Lloyds—as stated at the time—had been to achieve a measure of rationalization in face of growing competition from other materials, and in order to strengthen the group position in the export market. He also stated that reductions in output at Staveley had been to meet market conditions and had not been any more drastic than anywhere else within the group; in fact, there had been cases where Staveley had been maintained at a higher rate than elsewhere within the group.

Combating Corrosion

Lectures, films and an exhibition, designed to sustain the war against corrosion, were organized last week in London by Henry Wiggin & Company, Limited, at Londonderry House, Park Lane. (It is understood that repeat arrangements are also scheduled for provincial centres, shortly). Corrosion in all its forms is alleged to cost the country some £600,000,000 per year in lost production, maintenance and material replacement, and the objective behind last week's scheme was to propagate means of reducing this cost by the application of more-corrosion-resistant material in the construction of components and plant.

The exhibition described the different types of corrosion and how they arose and gave information on factors affecting the rate of attack and on the resistance of nickel-containing materials produced by the firm. Amongst the items on show from the castings field were a shell-moulded valve seat in H. Monel with very small machining allowances (Knowsley Cast Metal Company Limited); a sight-flow indicator, also in Monel (B. Rhodes & Son, Limited), and similar items with Monel clock and copper-alloy seal (W. H. Bramall & Company, Limited); cast Monel impellers (Knowsley Cast Metal Company and G. & J. Weir, Limited), chlorine pressure-reducing valves (Paterson Engineering Company, Limited); main valves and plugs and seatings for stop valves in K. Monel (Sir W. H. Bailey & Company, Limited); and hydrofluoric-acid valves (Silcoms, Limited). Features were also made of various corrosion test set-ups, the use of conveyor-belt fasteners in Monel and a display of furnace equipment using the firm's alloys.

Films shown included "Machining the Wiggin High-nickel Alloys," "Corrosion in Action," "Welding of Wiggin High-nickel Alloys," and "VPT 681-Nickel Tanker," and the lectures: "Corrosion Testing of Materials for Chemical Plant Construction," by J. B. Maylor, and "Influence of Corrosion on the Design of Chemical and Allied Plant," by E. Warde. The latter were supplemented by Corrosion Forums (on the Wednesday and Thursday afternoons) consisting of an introduction by H. Hodges, B.SC., on characteristics of the firms' alloys, followed by open discussions.

Forthcoming Events

OCTOBER 21

Institute of British Foundrymen

Lincolnshire branch: Visit to Royal Air Force College, Cranbrook, also presidential address by A. Sutherland.

OCTOBER 25

Institution of Mechanical Engineers

Presidential address on "Co-ordination in Engineering Research and the Conservation of Scientific and Technical Manpower," by Sir Kenneth Hague, 6 p.m., at 1, Birdcage Walk, Westminster, London, S.W.1.

National Trades Technical Societies

Derby Section: "Plastic Patternmaking," by a representative of Leicester, Lovell & Company, Limited, at Fletchers, Limited, Derby, 7.15 p.m.

Manchester Metallurgical Society

"Education in the Metallurgical Field," general discussion introduced by L. W. Derry, Prof. H. O'Neill, and D. R. O. Thomas, 6.30 p.m., at the headquarters of the Manchester Literary and Philosophical Society, George Street.

OCTOBER 26

Institute of British Foundrymen

London branch: "Gating for the Production of High Duty Iron Castings," by L. Clarke, 7.30 p.m., at the National Liberal Club, Whitehall Place, London, S.W.1.

Notes from the Branches

Lancashire

The Lancashire branch of the Institute of British Foundrymen held its first meeting of the 1961/62 session on October 7 at the Midland Hotel, Manchester. A welcome to new members was given by the new branch president, Mr. F. Lord, who in his presidential address asked the question "Is the Institute doing all it should in view of the new techniques being introduced into the industry?" He suggested the Lancashire branch might follow the lead given by the North East Lancashire section by holding an "open day" at the Technical College, with mutual benefit to all concerned. He concluded his address with a tribute to the work of the Institute's technical sub-committees and said the objective of the branch would be to emulate the IBF motto, "Science, Hand in Hand with Labour."

Mr. W. M. Lord was then called upon to deliver his paper entitled "Heat-treatment of Grey-iron Castings." The heat-treatment of cast iron, said the lecturer, was a well established practice in the foundry industry. It could not, however, be called a science but was in fact an art. There were differences in laboratory and workshop results, and very often heat-treatment was regarded as a remedy for foundry faults or as a salvage operation. He divided heat-treatment into three categories:—(1) Stress relief; (2) annealing and (3) normalizing, and then gave details of methods used and results obtained, illustrating his remarks with diagrams and lantern slides. In conclusion he thanked his directors for permission to present his paper.

Mr. Kirkham then proposed a vote of thanks to the lecturer which Mr. Connah seconded.

In the ensuing discussion, Mr. Lord made the following points. Weathering would not make any appreciable difference in the tensile strength of a 30-tons tensile iron, but stress relief should improve the properties. Typical castings selected for heat-treatment were alloy grey-iron castings having good abrasion-resistance, which when hardened and tempered were also machinable. Annealing of spheroidal-graphite iron altered the structure and elongation could be increased from three to 20 per cent. As to temperature control to prevent scaling the critical temperature below which air cooling could be used was about 600 deg. C.; annealing at this temperature should give trouble-free results. Asked for information on flame hardening, Mr. Lord replied that metal structure was important for this to be effective and combined carbon was a necessity. In the furnace shown in the illustrations combustion was balanced by the burner controls, and there was an automatic knock-off.

This ended the discussion and members were invited to accompany the president's party to a theatre show, followed by a dinner/dance. The meeting concluded with the chairman's vote of thanks to Mr. Lord for his excellent paper.

Stoke-on-Trent Section

The newly-elected president of the Stoke-on-Trent section, Mr. Bernard Cordall, referred to the tremendous advances made in the foundry industry in his presidential address at a dinner at the Grand Hotel, Hanley. He said technicians to-day were giving greater attention than ever to the designs of mechanical equipment to assist foundrymen. The research of various organizations added daily to industry's knowledge.

He went on to speak of the part the Institute had played in the industry, and said it was the duty of the section to carry on this work in the area. By so doing it would make available to apprentices and young men the knowledge gained by the combination of scientific research and the wisdom of practical foundrymen. There was in the industry much to attract the best of young people in offering both financial reward and vocational stimulation.

Sheffield

Dr. D. V. Riley is here shown delivering his address on "Science Hand in Hand with Labour" after his installation as president of the Sheffield and district branch at the Sheffield and Eccleshall Restaurant on October 2. Although his theme is the Institute's motto, it is capable of many new applications as the industry changes—and this Dr. Riley well brought out in his remarks.

ABBF Associate Membership

The Council of the Association of Bronze & Brass Founders have decided—in order to widen the influence of the Association—that associate membership shall henceforward be available to suppliers to the foundry trade, and others whose membership and co-operation is likely to be of benefit to the Association in serving the copper-base foundry industry generally. Applications are therefore invited from such firms in the categories mentioned who are interested in taking up the new offer. They should be addressed to the Association's secretaries, Heathcote and Coleman, 69, Harborne Road, Edgbaston, Birmingham, 15.

WATFORD FOUNDRY COMPANY, LIMITED, is discontinuing the production of iron castings as from October 27, but the company's non-ferrous foundry and patternshop are continuing in production.

A NEW TRADES SCHOOL for 1,300 students to be opened in Colombo, Ceylon, will have facilities for 400 full-time and 900 part-time students. It will provide instruction in the printing, building, electrical, motor, metalwork, and woodwork trades. Canada will grant Rs. 1,000,000 (about £75,000) towards the cost of the building, which will total Rs. 3,300,000 (about £247,000).

Personal

Commander ALAN B. DICKIE and Mr. F. H. STIMSON have been appointed assistant directors of Newman Hender & Company, Limited.

The Minister of Power has appointed Councillor R. RABITT, the Mayor of Worksop, to be a member of the East Midlands Gas Consultative Council.

An auditor at Stanton Ironworks Company, Limited, near Derby, Mr. HARRY DOUGLAS HAIG LUNGLEY has been appointed a county magistrate for Ilkeston.

Mr. PHINEAS J. STEVENS has retired from the boards of Tipper Industries, Limited (proprietors of Tipper Foundries, Limited), and the Stamford Engineering Company, Limited.

Mr. F. MENELAUS has been appointed a director of Wilkinsons Tools, Limited, a member of the Staveley Industries group. Mr. D. L. ATKINS has resigned from the board of Wilkinsons Tools.

Mr. R. L. HIGGIN has been appointed general manager of the components group of the Plessey Company, Limited. He joined the company in March 1959 as commercial executive of the components group.

Mr. W. J. A. WHYTE, overseas sales manager of R. & J. Dick, Limited, power transmission engineers, Greenhead Works, Glasgow, has retired from that post, but will continue as a director. Mr. A. C. AITKEN has been appointed sales director.

Mr. R. L. Frederick and Mr. E. R. Knapp have been appointed to the board (Mr. Knapp being made assistant managing director) of British Timken Division of the Timken Roller Bearing Company, Limited. Mr. H. E. MARKLEY has resigned from the board.

Canadian born Mr. H. F. HODGSON, chairman and managing director of Joseph Sankey & Sons, Limited, has retired. During his 25 years with the company he has seen the Hadley Castle Works grow from five to 50 acres in extent and its production increase 15 times.

Paterson Hughes Engineering Company, Limited, announce the retirement of Mr. GILBERT BEALING, after 17 years' service as their chief sales engineer for London and south of England. Mr. Bealing was apprenticed originally to Spencer (Melksham), Limited, in 1922.

Mr. R. G. MONKHOUSE, manager of the central engineering workshops at the United Steel Companies' Workington Iron & Steel Company branch has been appointed works manager (Ickles) at the Steel, Peech & Tozer branch and will take up his new post on November 1.

Dr. W. O. ALEXANDER, assistant research manager, of the metals division, Imperial Chemical Industries, Limited, has been appointed technical director of Foseco International, Limited, with effect from January 1, 1962. Foseco International is a subsidiary of Minerals Separation, Limited.

Mr. R. A. WIGGINS, assistant general works engineer of Leyland Motors, Limited, for the last six years, has been appointed general works engineer of the company. Mr. F. GRIMSHAW, O.B.E., who has held this position for many years, will in future act as consultant to the company on development projects.

Sir IVAN A. R. STEDEFORD, G.B.E., chairman and managing director of Tube Investments, Limited, has relinquished the managing directorship, whilst continuing as executive chairman. Sir WILLIAM STRATH, K.C.B., Mr. W. HACKETT, JNR., and Mr. R. D. YOUNG have been appointed managing directors of the group.

Mr. WILLIAM D. TAYLOR has joined the Society of Motor Manufacturers and Traders as overseas secretary and manager, British manufacturers section, in succession to Mr. DONALD M. TAILBY. Mr. JOHN D. WRIGHT GENT becomes head of the legal department in succession to Mr. R. S. WEIR, who is leaving the Society at the end of this month.

Mr. ALFRED G. WELLER is retiring as secretary of the Nottingham Society of Engineers, a position he has held for the past 31 years. Mr. Weller is chairman and managing director of the Weller Gauge & Welding Company, Limited, of Bilborough, Nottingham, and a director of other companies. He is a member of the Institute of Welding and the Institution of Production Engineers.

Employees of the Birmingham, London and Brynmawr factories of John Webb & Company, Limited, the 125-year-old firm of brassfounders, joined in offering congratulations to their chairman, Mr. TIMOTHY COLMAN, on October 3, on his completion of 50 years' service with the company. Mr. Colman was presented with a Royal Danish china flower vase and a gold wrist watch. Now in his 79th year, Mr. Colman joined the board of the firm in 1911 and has been chairman since 1922.

Mr. F. A. LYTTON, export manager, Jessop-Saville, Limited, Brightside, Sheffield, since January, 1960, has become a member of the company's local board. He will continue to be responsible for the overseas connection as export sales director. Mr. Lytton is a metallurgist who joined the firm as an overseas technical representative three years after graduating from London University. He was appointed assistant export manager in 1957. Mr. A. H. MILLS, sales manager of Jessop-Saville (Small Tools), Limited, Rotherham subsidiary of Jessop-Saville, has been appointed sales director of the subsidiary company.

Mr. A. M. SIMMERS, secretary and special director of the English Steel Corporation, Limited, Sheffield, has been appointed secretary and controller of administration of Vickers, Limited, parent company of the group. He was articled to Camm, Metcalfe and Company, chartered accountants, Sheffield, and was with Arthur Lee and Sons, Limited, from 1936 to 1946, first as assistant secretary and then as secretary. He became secretary of Firth-Vickers Stainless Steels, Limited, and in 1955 went as secretary to the English Steel Corporation. He has been a director of the English Steel subsidiaries, the Castings, Tool and Spring Corporations, and the Darlington Forge, and also secretary of the Manchester subsidiary, Taylor Bros. and Company, Limited.

Mr. GEOFFREY CUNLIFFE, managing director of Norcros, Limited, has been elected president of the British Standards Institution in succession to Mr. R. E. HUFFAM who has been elected a deputy-president. Mr. Cunliffe had earlier been elected chairman of BSI's General Council. Sir HERBERT MANZONI, city engineer of Birmingham, and Mr. JOHN RYAN, vice-chairman, Metal Box Company, Limited, have been re-elected as deputy-presidents. Mr. A. D. BONHAM-CARTER, UK co-ordinating director of Unilever, Limited, succeeds Mr. Cunliffe as chairman of BSI's finance committee. Sir ANTHONY H. M. BOWLBY becomes chairman of the Institution's engineering divisional Council in succession to Sir STANLEY RAWSON, whose term of office had expired. Before being appointed head of Norcros (the industrial holdings company) in 1959, Mr. Cunliffe was deputy chairman of British Aluminium Company, Limited.

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Company News

J. & J. DYSON, LIMITED—A highly successful year with all past records beaten is reported by Mr. Alexander Lomas, chairman. Trade is being maintained at a satisfactory level, and although there has been a slackening in demand for refractory materials during the summer, this is confidently expected to be rectified during the next few months. This, coupled with the fact that the subsidiaries are making an increased contribution, leads to the hope that the current year will also be a successful one.

HILGER & WATTS, LIMITED, manufacturers of scientific instruments, of London, N.W.1—An agreement has been reached whereby the company will offer to acquire the whole of the issued 560,000 ordinary 4s. shares of W. Ottway & Company, Limited, manufacturers of scientific instruments, of London, W.3, on the basis of one Hilger & Watts ordinary 5s. share for every six ordinary shares of Ottway. The directors of Ottway have agreed to accept the offer in respect of their own holdings and will recommend acceptance by all other shareholders.

CROSSLEY BROS., LIMITED, makers of locomotive, marine, and stationary-type diesel engines, gas engines, etc., of Manchester—Since the close of the financial year the takeover of Furnival & Company, Limited, has been completed and another project for a product other than the parent's current manufactures is in an advanced stage of negotiation, states the chairman, Mr. H. D. Carter. The future is difficult to see as, in the short term, there is ever keener competition in export markets for a reduced volume of business, which means "an international dog-fight on price."

HORSELEY BRIDGE & THOMAS PIGGOTT, LIMITED, constructional engineers, bridge builders, ironfounders, etc., of Tipton (Staffs)—While not of the magnitude of the order-book which cushioned the company through the recession, the volume of unexecuted orders is very reasonable and will keep the undertaking fully employed for some months, but later contracts may have to be taken at fine profit margins, states the chairman, Mr. J. V. Sheffield. Group profit before tax in the year ended March 31, 1961, which included the company's 51 per cent. proportion of the loss in Mechans, Limited, amounted to £312,048 (£333,689).

BABCOCK & WILCOX, LIMITED, engineers, manufacturers of water-tube boilers, mechanical-handling plant, etc., of London, N.W.1—In reaching their decision not to pay an interim dividend for 1961, the directors state that trading results for the year to date have been affected by the low level of manufacturing activity in the earlier part of the year, by nuclear contracts, and by a number of major outstanding claims on contracts still under discussion. Longer term prospects have increased and the order book now stands at a higher figure than at any time in the past four years.

SILENTBLOC, LIMITED, makers of anti-vibration devices, of Crawley (Sussex)—Turnover declined slightly in the year to May 31, 1961, while that of Andre Rubber Company, Limited, increased sufficiently to offset the parent company's decrease, with the result that the group profit showed a marginal gain. Besides the motor-car industry, the group now supplies industries in other fields including general engineering aircraft, railways, textile machinery, shipbuilding, wharves and road building, says the chairman, Mr. B. H. Dullanty. In many cases the company absorbed increases in costs without any corresponding rise in selling prices.

Catalogues

Sprayed Asbestos. In publication No. NAP/9145, Chancery Insulations, Limited, 8 Upper Grosvenor Street, Grosvenor Square, London, W.1, describe and illustrate a method of fire protection by spraying on to any surface Seel asbestos fibres, using water and a suitable binder. Whilst the two most important functions of the coating are fire-resistance and thermal insulation, the material can also be used for sound absorption, dust exclusion, and as an anti-condensation and anti-corrosion finish. Normally the weight of the sprayed coating is of the order of 8 lb. per cu. ft., but this can be varied.

Polyester Resins. Using the title "The Cellobond Polyester Story," British Resin Products, Limited, Devonshire House, Piccadilly, London, W.1, have issued a 24-page well-illustrated brochure which virtually covers the manufacture and properties of this material. Then follow a series of applications in industry, such as in the automobile industry, boat-building, and rainwater goods. In this last field, gutters and fall-pipes are shown. In several instances goods are described which are in competition with the founding industry, whilst others are useful in the conduct of foundry operations.

Enclosed-chain Overhead Conveyor System. In publication No. B.B. 611, Bagshawe & Company, Limited, Dunstable, Bedfordshire, describe and illustrate the components they have designed and manufacture for the enclosing of chain conveyors, together with the various drive units to be incorporated. The many advantages—including added safety—to be expected from the use of enclosed chain conveyors are logically set out.

Industrial Ovens and Filtration Equipment. In publication Chal. 14, Controlled Heat and Air, Limited, Cornwall Road, Smethwick, illustrate and describe *inter alia* several core- and mould-drying stoves of both the batch and continuous type. In the section dealing with filtration there is an annotated illustration of a dust collector in a chemical factory which is of a type suitable for foundry ventilation.

Gear Pumps. In publication No. GP 2¼/7/61, the Brooke Tool Manufacturing Company, Limited, Warwick Road, Birmingham, first detail the range of pumps they manufacture. For several of these performance charts are included, whilst for all types a mass of data are presented as tables for easy conversion of viscosities, cu. ins. to imperial gallons, etc.—figures which are often difficult to find in text-books.

Noise Reduction. Subsequent to the printing in the FOUNDRY TRADE JOURNAL recently of a leading article on noise abatement, Acoustical Investigation and Research Organization, Limited, 118, Cromwell Road, London, S.W.7, consulting engineers, have submitted a leaflet which describes the facilities they have at their laboratory at Hemel Hempstead for carrying out tests and researches in this important field.

Graphite Products. Graphite Products, Limited, Northfields, Wandsworth Park, London, S.W.18—one of the Morgan Crucible group of companies—have issued eight publications covering the Foliac range of materials. Of these the most important to readers is GP 69, as it includes *inter alia* matters of interest to makers of die-castings.

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WHATEVER YOUR POSITION

News in Brief

THE FORTY-THIRD INTERNATIONAL MOTOR SHOW at Turin is being held from October 28-November 8 next.

UNDER DECREE No. 2, recently published in Nicaragua, export of scrap iron, aluminium, bronze and copper is prohibited.

BRITISH OXYGEN COMPANY, LIMITED, Brinsworth, Rotherham, have constructed the prototype of a fully-automatic transportable plant capable of producing 30 tons of oxygen a day.

A SECOND Norwegian bulk-cargo ship has been ordered from Harland & Wolff, Limited, Glasgow, similar to one of 15,000 tons, announced a few weeks ago. Together they are worth about £2,000,000.

THE INDUSTRIAL ESTABLISHMENTS of the Ukraine have fulfilled, ahead of time, the nine-month plan for gross output and output of key products. Production of iron went up by 1,400,000 tons, steel by 1,400,000 tons, and rolled metal by 1,300,000 tons.

TECHNICAL STUDENTS IN SYRIA, studying under the United Nations Children's Fund (UNICEF), are being trained on Midgley & Sutcliffe "Richmond" milling machines. Midgley & Sutcliffe is one of the companies in the George Cohen 600 Group, Limited.

THE 1961 SIR ALFRED HERBERT PAPER, "Finance for Industrial Growth" was presented by Mr. D. L. Donne, executive director, Charterhouse Industrial Development Company, at the Royal Aeronautical Society, London, on October 17.

A PARTY OF 20 FRENCH STEELWORKS ENGINEERS, who recently visited Sheffield, included in their itinerary a tour of the iron foundries of the Brightside Foundry & Engineering Company, Limited, and a visit to the Shepcote Lane Works of Firth-Vickers Stainless Steels, Limited.

A PIPELINE SERVICE will be installed from the new tonnage-oxygen plant being constructed by the British Oxygen Company, Limited, at Brinsworth, Rotherham, to feed electric-arc furnaces at Steel, Peech & Tozer, Rotherham, and the English Steel Corporation, Limited, Sheffield.

WORK HAS STARTED at Derby on a £1,250,000 scheme to provide new engineering laboratories for British Railways. The buildings will become the headquarters of the director of research of British Railways, whose present office is in London. The site is near an existing block of railway laboratories.

ALDERMAN NORMAN LEDSON, Mayor of Rochdale, travelled to Spain to open the new factory for Ratcliffe's Springs, Limited, last month. The company has signed a technical-aid agreement with the largest manufacturers of diesel engines and trucks in Spain, and the new company, Ratcliffe Iberica, has been formed.

AGAINST WORLD COMPETITION Yale & Towne British Materials Handling Division has won an order for 16 trucks worth £26,000. These have been bought by the Treasury, Malta, for use in the port of Valletta. This latest export order follows other port successes at Singapore, Mombasa, Barbados, Norway and Colombo.

CARRON COMPANY, of Falkirk, have secured a £2,000,000 contract to supply segment castings for the Jarrow-Howdon tunnel under the River Tyne. The contract will take three years to complete. Sixteen months ago the company was awarded a similar contract for the Whiteinch Tunnel under the River Clyde at Glasgow.

DURBAN FALKIRK IRON COMPANY (PTY.), LIMITED, South Africa, have bought a 15-acre site in Que Que, Southern Rhodesia, for industrial development. It is the intention of the company to build a £150,000 factory which will make a full range of coal-fired stoves, Defy electric stoves and three-legged cooking pots. The plant, when built, is expected to give employment to about 125 Europeans and Africans.

A NEW DOCK to cost about £12,000,000 and able to accommodate the largest ocean-going ships is one of the long-term projects under consideration by the Clyde Navigation Trust. Parliamentary permission for a new basin west of the present King George V Dock has already been obtained, but says Mr. G. R. Proudfoot, general manager and secretary of the Trust, it is difficult to forecast when work might be started.

TO REPLACE three oil-fired furnaces, the Austin Motor Company, Limited, of Longbridge, near Birmingham, have installed a GWB two-tunnel induction heater for the forging of manganese-molybdenum billets. The new furnace, specially designed by GWB Furnaces, Limited, of Dudley, Worcs., will do twice the work of the three conventional type furnaces. Connecting rods for BMC engines are finally produced from the billets.

CROFTS ENGINEERS, LIMITED, Bradford, celebrate their 75th anniversary next year. The company, which concentrates on the manufacture of power-transmission equipment, started with one workshop employing seven people and now has works covering 35 acres with steel, iron and non-ferrous foundries, machine and assembly shops of modern layout. There are associated companies in South Africa, the United States and Canada.

A NEW GEAR-CUTTING SECTION, covering an area of 7,000 sq. ft., has been commissioned by Ashok Leyland, Limited, at its Madras factory. Components for the heavy-duty 5-speed gearbox fitted in the Ashok Leyland Comet will be manufactured there, and equipment worth more than £200,000 has already been installed. Two of the group's technicians and one from the Indian Institute of Technology are training machine operators and setters.

A NEW BRASS FOUNDRY is proposed by Lawson, Turnbull & Company, Limited, at 7, Willowdale Place, Aberdeen, which the company recently acquired from the General Electric Company, Limited. It is also planned to locate a new brass-finishing shop on the site. These developments follow the appointment of this 80-year-old plumbers' merchants and pipemaking company as main north-east distributors for the GEC in certain sections of their electrical distribution.

EXTENSIONS costing approximately £350,000 have recently been completed at the works of Murex Welding Processes, Limited, at Waltham Cross, Hertfordshire. The new buildings consist of a 500 ft.-long single-storey production shop having an uninterrupted floor area of 62,000 sq. ft., for the manufacture of electric-arc welding plant, and a two-storey office block of 7,200 sq. ft. to accommodate the plant sales department, drawing office and works engineer's department.

A SCALE MODEL of the radio telescope at Jodrell Bank was presented recently by the United Steel Companies, Limited, to the Science Museum. The presentation was made by Mr. A. J. Peech, deputy chairman and general managing director of United Steel, and the model was received on behalf of the Science Museum by Dr. H. H. Follett, director. The radio telescope was built by United Steel Structural Company, Limited, of Scunthorpe, a United Steel subsidiary.

MORE THAN 70 MEMBERS of the Iron and Steel

(Continued on page 500)

Photo by courtesy of Fibres Division, Imperial Chemical Industries Ltd. Manufacturers of 'Terylene' polyester fibre.

G IS FOR CONVEYOR BELTS at a new I.C.I. plant in Cheshire, where eight Goodyear belts of rubber and 'Terylene' carry coke, burnt lime and coke/lime mixture. 'Terylene' was chosen for its flexibility and strength, which allows exceptionally deep troughing so that deck plates, skirt boards, etc., are eliminated and idlers can be spaced 50% wider apart. 'Terylene' also withstands the heat of the coke (carried at up to 120°C), is rotproof and resists moisture penetration. For the *right* conveyor belt, installed in the *right* way and maintained in the *right* manner, contact Goodyear Industrial Products Division at Wolverhampton.

GOODYEAR THE GREATEST NAME IN RUBBER

The Goodyear Tyre & Rubber Co. (G.B.) Ltd., Industrial Products Dept., Wolverhampton. Export Enquiries: 17 Stratton Street, London W.1

News in Brief

(Continued from page 498)

Institute flew from London to New York in a specially chartered BOAC Britannia airliner on October 17 for a three-week tour of the USA and Canada. During their tour they will attend the first special meeting of the Institute to be held in America since 1904, and will visit Pittsburgh and Cleveland, and Middletown (Ohio), Chicago, and Hamilton and Welland (Ontario) before returning to London on November 8.

MR. PHILIP NEILL, a director of James Neill (Sheffield), Limited, spoke to the October meeting of the Sheffield branch of the Institute of Export in Sheffield on "Moscow 1961." He was in Moscow during the summer supervising his firm's stand at the British Trade Fair. Speaking of the Moscow permanent Exhibition of Economic Achievement which has 100 large pavilions, Mr. Neill said that in the machine-tool section, there was practically every type of machine-tool exhibited.

THE CONSTRUCTION industries have taken a positive step towards preventing crane accidents by publishing a standard set of crane signals. The new system has been devised after detailed discussions throughout the industry and with government departments and other industries and incorporates the best and most commonly used of the existing signals. Copies—in a pocket-size plastic form—are available at 9d. each from the British Iron & Steel Federation, Steel House, Tothill Street, London, S.W.1.

SUGGESTIONS from works and office employees of Scammell Lorries, Limited, for improving production methods, vehicle design, and administrative techniques, have been flowing in at the rate of 12 per month since the introduction of the suggestions scheme last year. Well over 100 suggestions have been received, of which 20 have qualified for cash awards. Each suggestion is considered by the selection committee, and a monthly bulletin is issued announcing the awards and explaining the reason for rejected suggestions.

THE MASTER CUTLER, Mr. C. H. T. Williams, officially opened the Hollowford training centre at Castelton, Derbyshire, on September 30. It is a joint project of Sheffield industry and Sheffield Anglican diocese and is designed to provide recreative and discussion facilities for young people working in industry. The cost has been £25,000, of which the Ministry of Education have provided half. Mr. H. P. Forder, managing director of Samuel Fox & Company, Limited, presided at the opening ceremony.

FIRTH-VICKERS, LIMITED, Sheffield, inaugurated a full-scale savings drive as part of Premium Bond Week on October 9, when the Lord Mayor of Sheffield, Alderman J. W. Sterland, presented six members of the staff with medals for voluntary long service as officials of the company's Staff Savings Club. Five of the recipients have worked for the club for more than 10 years. The savings club was started in 1949, and a third of the total staff of the company are now members. The gross deposits during the 12 years that the club has been in existence now amount to £37,222.

MR. G. PAGE, personnel manager, Jessop-Saville, Limited, Brightside, Sheffield, presented St. John Ambulance Brigade corps awards to 80 employees who took the examination at the firm's Weedon Street canteen in mid-September. They included 52-year-old Mr. Thomas Sydney Tweedale, who joined the works corps in 1923, and had passed examinations for the 35th year in succession. The firm is one of the few Sheffield firms to have a junior section of the ambulance corps, which Mr. Page said, was newly formed to encourage young people. Nine apprentices and juniors received awards.

MR. J. R. BOTTOMLEY, engineering director, Jessop-Saville, Limited, Brightside, Sheffield, opened the firm's sports club's 17th annual horticultural show last month. He himself was among the prize-winners, as were also two other directors of the firm, Mr. G. T. Harris, assistant managing director, and Mr. J. F. Wallis, sales director. Mr. G. Page, personnel manager, was the overall winner in the flowers section, and Mr. E. Allen, heat-treatment department, in the vegetables section. Mr. Ken Laybourne, divisional sales manager, who entered a flower show for the first time in his life, won five prizes.

A HIGH-CARBON FERROCHROME SMELTER, which it is expected will start production in Que Que, Southern Rhodesia, next July, will result in a new £1,100,000 export industry for the Federation and may also lead to developments which will absorb a total labour force of 2,500 Rhodesians. The smelter—which will cost £1,000,000 to build—will be fed with 25,000 tons of chromite concentrates a year to produce some 12,000 tons of high-carbon ferrochrome. Initially all the production will be exported. Windsor Ferroalloys (Pvt.), Limited, Que Que, have bought a 60-acre site where it is hoped that the new smelter will be only the beginning of the development in Que Que.

CELEBRATIONS BEGAN on October 10 of the golden jubilee of Padley & Venables, Limited, stainless-steel processers of Aldridge, near Walsall. The company also has a plant at Sheffield for manufacture of compressed-air and mining tool accessories. Mr. Richard Padley, founder of the company, established his first enterprise in Sheffield in 1911 but moved to Birmingham in 1927 where he concentrated on the development of stainless steel. Mr. Thomas Edward Venables had joined him in 1918 and, in 1932, Padley & Venables, Limited, opened its first factory in Northwood Street, Birmingham; in 1940 a move was made to premises in Livery Street and in 1958 operations were transferred to a modern plant on the new industrial estate at Aldridge.

SIR WILLIAM MCFADZEAN, chairman of the Export Council for Europe, speaking in Birmingham at a meeting of the Institute of Marketing and Sales Management, said that one of the chief findings of the "Pathfinder" missions, sent by the Export Council to 19 OEEC countries during the past year, was that British exports to Western Europe were uneven and inadequate and a more dynamic approach to European markets was imperative. Sir William went on to say that another major finding was the tremendous size of the European market. The population of the "Six" and the "Seven" plus Finland was 265,000,000 and if countries like Spain, not in OECC, were included the total population became 347,000,000, twice the population of the United States. "We have got to recognise that this is possibly the most exciting market in the world to-day," he added.

Obituary

MR. RONALD G. GREEN, a partner in the firm of George Green & Company, foundry melting equipment engineers, Keighley, Yorks, and director of their associate companies, died on October 4, aged 59 years.

MR. THOMAS MOODIE, a lecturer on patternmaking at the Burnbank foundry trades centre, has died at the age of 54. He became ill while lecturing to a class and was removed to Falkirk Royal Infirmary where he died shortly after admission.

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AP155

Raw Material Markets

Iron and Steel

Overall outputs of iron castings are maintained at fairly good levels, but the amount of business now coming to hand is in many instances on a reduced scale, and it is with difficulty that some of the foundries maintain a five-day working week. At these units the orders arising are barely sufficient to cover day-to-day production and forward bookings are scarce.

The motor vehicle industry, the machine-tool and engineering trades, steelworks, and other users are now indenting for smaller quantities and although regular orders are coming to hand the tonnages specified are limited. The light foundries, particularly those connected with the domestic utensil trade, have for a long time past been unable to obtain sufficient work to keep their plants fully occupied, and the jobbing and textile foundries are also in need of more work.

Raw materials are available in much larger quantities than those now being taken up by the foundries. The call for low phosphorus irons by the engineering and speciality foundries is kept up at fairly reasonable levels, but much larger tonnages could be supplied. Hematite and refined iron are also readily available. The call for high phosphorus irons is well below the quantities which could be supplied to the light, jobbing, textile, and some of the engineering foundries which use this grade.

Production of basic pig-iron for the steelworks, although well below capacity levels, is more than sufficient to meet current demand, and when required deliveries could be stepped up appreciably. Fairly substantial quantities of this iron are being exported, and the foundry grades of pig-iron and hematite are also available for shipment overseas. Some orders from overseas buyers are being secured, but competition is severe.

The foundries are able to cover for most of the scrap they require, and foundry coke, ganister, limestone, and firebricks are in good supply.

Many of the re-rollers are working on a reduced number of shifts as present business arising for most of their products is only moderate. The demand for small bars, strip, etc., shows little improvement. Reinforcing rods and bars continue to be taken up in fairly good quantities. Overall capacity could deal with a much larger flow of business, but with the orders now arising difficulty is experienced in planning rolling programmes.

Plentiful supplies of mild steel semis continue at the disposal of the re-rollers, but the call is nothing near the tonnages which the steelworks could supply. Carbon steel semis are also available in larger quantities than those now being taken up, and alloy steels can also be secured but for more extended delivery. Arisings at the steelworks of suitable re-rolling quality defectives and crops are being taken up by the re-rollers.

Non-ferrous Metals

The improvement in the copper market in London over the past two weeks has been largely due to the sharp fall in the stocks of refined copper held in LME warehouses and to heavy support buying by a major copper producer. The sizeable drop in stocks during the past fortnight reverses a trend which has persisted almost without interruption since the middle of 1960 and finally pushed stocks up to over 22,000 tons, the highest figure for several years. This gave the market a firm undertone and, combined with "influential buying," bear covering was much in evidence. Nevertheless, demand is not good from the UK or from the Continent and a change for the better is tied up with the business outlook in the months ahead.

The US copper market is in better fettle than London. The intake price of scrap was raised last week, although the comment has been made that this was due to competition for foreign secondary metal from Japanese sources. The US price of 31 cents a pound is still applicable to both producers and custom smelters.

Tin was a nervous market in London, Singapore and New York in front of the International Tin Council's communiqué issued towards the end of last week and prices fluctuated widely in all three centres. The communiqué, when it did come, was disappointing. It had been expected that the floor price would be raised from £800 a ton to £1,000 a ton but this move by the producers was defeated by the consumers. While there is no shortage of physical metal at present, all available statistics point to consumption still outrunning production so that by the time the ITC meets again in February, 1962, pipelines should be very much emptier than now. The US market is quietly steady and the price is above $1.21 a pound.

Lead continues to experience idle trading conditions in London with the price moving narrowly either side of £63 a ton. In the US the market is quiet with the quotation unchanged at 11 cents a pound.

Zinc in London is steady, with buyers having the edge on sellers, but the trend is still inconclusive and the market hesitant to act until the outcome of the lead-zinc study group meeting which began this week. The price is moving narrowly around £72 a ton. In the US the market is good with improved demand coming from the motor car industry. The price is unaltered at 11½ cents a pound.

New Magnesium Plant

Power-Gas Corporation, Limited, of Stockton-on-Tees, a member of the Davy-Ashmore Group, has been appointed main contractors by Magnesium Elektron, Limited, for the engineering of a new plant to produce 5,000 tons per annum of magnesium at Hopton, near Wirksworth, in Derbyshire. The completion of the Hopton project will make the UK largely independent of imports from overseas of this strategically important light metal. The plant will extract magnesium of 99.9 per cent. purity from local dolomite by a reduction process which has not previously been operated on a commercial scale in this country. The total value of the completed plant to Magnesium Elektron is expected to be in the region of £2,000,000. This is a further development of the activity of Power-Gas in the field of non-ferrous metallurgical plant.

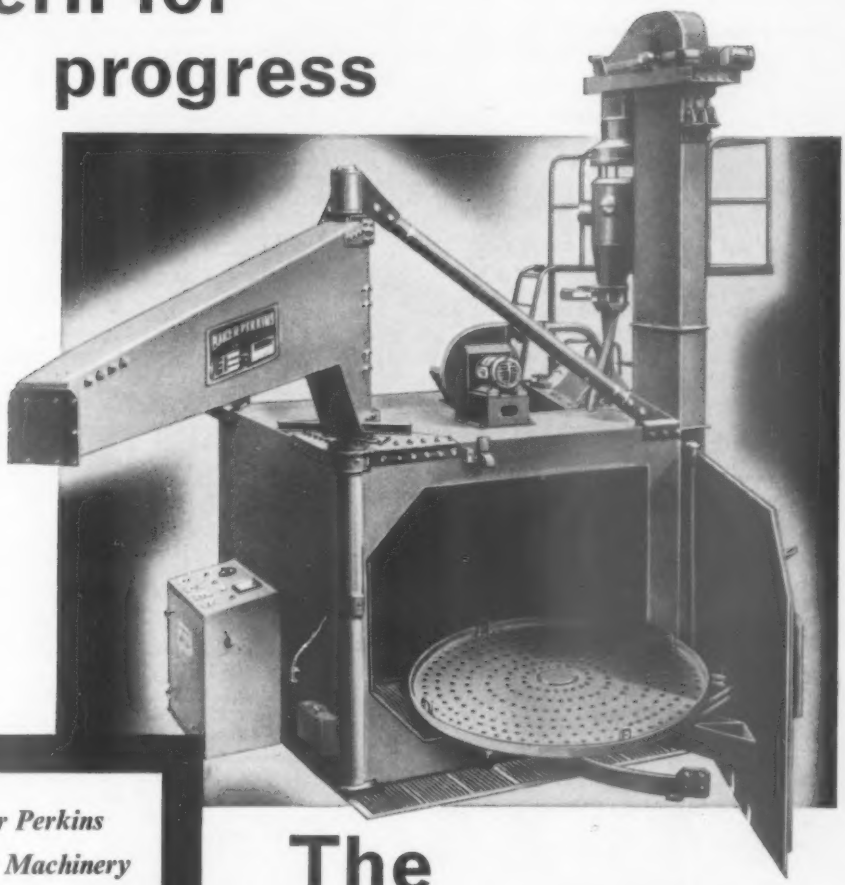
Board Changes

TECALEMIT, LIMITED—Mr. T. C. Worth has been appointed a director.

UNITED STEEL COMPANIES, LIMITED—Mr. H. Smith has been appointed a director.

ASSOCIATED ELECTRICAL INDUSTRIES, LIMITED—Mr. A. C. Main has been appointed director of manufacturing services. He remains as a non-executive director on the board of AEI (Manchester), Limited.

pattern for progress



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Current Prices of Iron, Steel, and Non-ferrous Metals

(Basis prices, delivered unless otherwise stated. Prices following side headings marked* are subject to an increase of 1 per cent. under Iron and Steel Board Price Determination, 1961, No. 2.)

October 18, 1961

PIG-IRON

* **Foundry Iron.**—No. 3 IRON, CLASS 2, 10-ton lots or over, Middlesbrough, £21 17s. 0d.; Birmingham, £21 9s. 3d.

* **Low-phosphorus Iron.**—Over 0.10 to 0.40 per cent. P, 10-ton lots or over, £23 5s. 0d., delivered Birmingham; £23 10s. 0d., delivered Grangemouth.

Cylinder and Refined Irons.—North Zone, £25 6s. 6d.; South Zone, £25 9s. 0d.

Refined Malleable.—P, 0.10 per cent. max.; North Zone, £26 6s. 6d.; South Zone, £26 9s. 0d.

* **Hematite.**—Si less than 2 per cent, S. & P. over 0.03 to 0.05 per cent., 10-ton lots or over: N.-E. of England (local iron), £23 19s. 0d.; Scotland (Scotch iron), Zone S.1, £24 5s. 6d.; Sheffield, £25 9s. 0d.; Birmingham, £25 13s. 0d.; South Wales (Welsh iron), £23 19s. 0d.

* **Basic Pig-iron.**—£20 3s. 0d., delivered Staffs, Derbyshire, Notts, Lincs, Rutland, Northants, and Leicestershire in 10-ton lots or over.

FERRO-ALLOYS

(per ton unless otherwise stated, delivered)

Ferro-Silicon (6-ton lots and over).—45 per cent. Si, £45 0s. 0d. to £48 0s. 0d., scale 15s. 0d. per unit, lumpy, 75 per cent. Si, £62 10s. 0d. to £66 10s. 0d., scale 15s. 0d. per unit, lumpy.

Ferro-vanadium.—50/60 per cent., 22s. 6d. per lb. of V.

Ferro-molybdenum.—65/70 per cent., carbon-free, 14s.1d. per lb. of Mo

Ferro-titanium.—20/25 per cent., 2-3 per cent. Cu, £250 0s. 0d.; 38/40 per cent., commercially carbon-free, £287 0s. 0d.

Ferro-tungsten.—80/85 per cent., 9s. 11d. per lb. of W.

Tungsten Metal Powder.—98/99 per cent., 12s. 11d. per lb. of W.

Ferro-chrome (6-ton lots and over, lumpy).—4/6 per cent. C, £80 10s. 0d. to £84 10s. 0d., basis 60 per cent. Cr scale 27s. 0d. to 28s. 6d. per unit; over 6 per cent. C, £79 0s. 0d. to £82 10s. 0d., basis 60 per cent. Cr, scale, 27s. 0d. to 28s. 6d. per unit; 2 per cent. C,* 1s. 8d. to 1s. 11d. per lb. Cr; 1 per cent. C,* 1s. 8d. to 1s. 11½d. per lb. Cr; 0.15 per cent. C,* 1s. 9½d. to 2s. 0½d. per lb. Cr.; 0.10 per cent. C,* 1s. 9½d. to 2s. 0½d. per lb. Cr; 0.06 per cent. C,* 1s. 10½d. to 2s. 1d. per lb. Cr. * Average 68-70 per cent.

Metallic Chromium.—98/99 per cent., 6s. 9d. per lb.

Metallic Manganese.—94/96 per cent., carbon-free, £275 0s. 0d.; 96/98 per cent., £285 0s. 0d.

Ferro-columbium.—65/67 per cent. Cb + Ta, 19s. 0d. per lb., Cb + Ta.

Ferro-manganese (Standard).—78 per cent., £58 10s. 0d.

SEMI-FINISHED STEEL

* **Re-rolling Billets, Blooms, and Slabs.**—BASIC: Soft u.t., 100 tons and over, £31 15s. 6d.; tested, 0.08 to 0.33 per cent. C, 100 tons and over, £32 5s. 6d.; hard (0.41 to 0.60 per cent. C), 50 tons and over, £33 17s. 0d.; silico-manganese, 50 tons and over, £42 16s. 6d.; free-cutting, 50 tons and over, £35 4s. 6d. SIEMENS MARTIN ACID (50 tons and over): Up to 0.25 per cent. C; £40 11s. 0d.; silico-manganese, £43 4s. 0d.

* **Billets, Blooms, and Slabs for Forging and for Stamping** 50 tons and over).—BASIC: Soft, up to 0.33 per cent. C, £37 0s. 0d.; basic, hard, over 0.41 up to 0.60 per cent. C, £38 2s. 6d.; acid, up to 0.25 per cent. C, £41 14s. 0d.

FINISHED STEEL

* **Heavy Plates and Sections** (50 tons and over).—Ship plate (N.-E. Coast), £40 7s. 0d.; boiler plates (N.-E. Coast), £42 17s. 0d.; floor plates (N.-E. Coast), £41 16s. 0d.; angles (N.-E. Coast), £38 1s. 6d.; joists (N.-E. Coast), £37 17s. 6d.

* **Small Bars, Sheets, etc.**—Rounds and squares, under 3 in., and flats 5 in. wide and under, untested soft basic, 50 tons and over, £39 1s. 0d.; under 10 tons to 4 tons, £40 18s. 6d.; under 4 tons to 2 tons, £41 3s. 6d.; hoop and strip, coils, 100 tons and over, £38 0s. 0d.; uncoated strip mill coils, hot rolled, under 3 mm. to 12g., 25 tons to under 50 tons, £43 16s. 0d.; black sheets (hand mill), 24g., 10 tons and over, £57 14s. 6d.; galvanized corrugated sheets, 24g., 10 tons and over, £67 4s. 0d.

Alloy Steel Bars.—1 in. dia. and up: Nickel, £67 16s. 0d.; nickel-chrome, £100 18s. 0d.; nickel-chrome-molybdenum, £113 11s. 0d., in lots of 25 tons and over.

NON-FERROUS METALS

Copper.—Cash, £229 10s. 0d. to £229 15s. 0d.; three months, £229 10s. 0d. to £229 15s. 0d.; settlement, £229 15s. 0d.

Copper, Tubes, etc.—Solid-drawn tubes, 2s. 2½d. per lb. rods, 247s. 0d. per cwt. basis; 20 s.w.g., 382s. 0d. per cwt.

Tin.—Cash, £939 0s. 0d. to £940 0s. 0d.; three months £947 0s. 0d. to £948 0s. 0d.; settlement, £940 0s. 0d.

Lead (Refined Pig).—Second half October, £63 0s. 0d to £63 5s. 0d.; second half January £64 7s. 6d. to £64 10s. 0d. settlement, £63 5s. 0d.

Zinc.—Second half October, £72 12s. 6d. to £72 15s. 0d.; second half January, £73 12s. 6d. to £73 15s. 0d.; settlement, £72 15s. 0d.

Zinc Sheets, etc.—Sheets, 15g. and thicker, all English destinations, £110 12s. 6d.; rolled zinc (boiler plates), all English destinations, £107 17s. 6d.; zinc oxide (Red Seal); d/d buyers' premises, £90 0s. 0d.

Brass Tubes, etc.—Solid-drawn tubes 1s. 9½d. per lb.; sheets to 10 w.g., 195s. 0d. per cwt.; wire, 2s. 8½d.; rolled metal, 195s. 0d. per cwt.

Brass (Brazing).—BS1400, SCB2, £177; SCB3, £173.

Brass (High Tensile).—BS1400, HTB1, £195; HTB2 £214; HTB3, £230.

Gunmetal.—BS1400, LG2, £213; LG3, £224; G1, 1½% £284; G1 ½% £298.

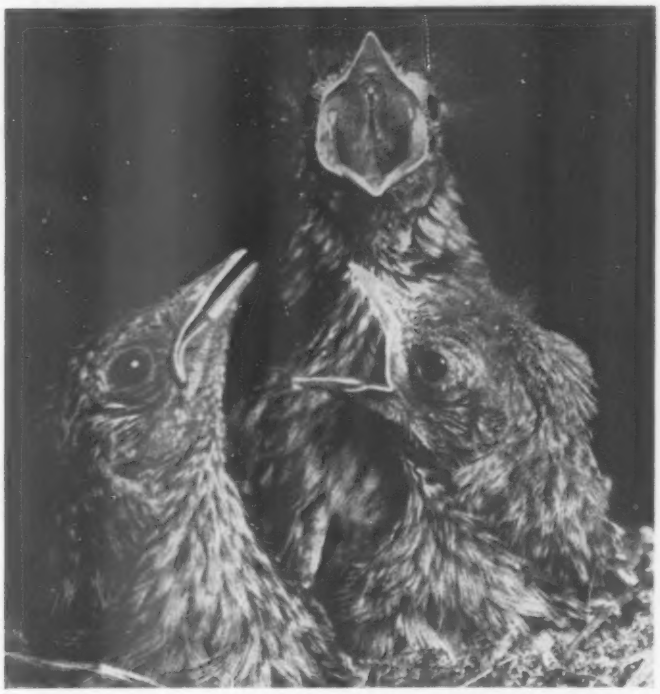
Phosphor Bronze.—BS1400, PB1 (AID released), £315; PB4 £304; BS1400, 90/10/1%, £302.

Leaded Phosphor Bronze.—BS1400, LPB1, £238.

Phosphor Bronze Strip, etc.—Strip, 300s. 3d. per cwt.; wire, 4s. 2½d. per lb.; rods, 3s. 5d.; tubes, 3s. 5d.; chill cast bars, solids 3s. 5½d.; cored, 3s. 6½d. (CHARLES CLIFFORD LIMITED).

Nickel Silver, etc.—Rolled metal, 3 in. to 9 in. wide × 0.056, 3s. 11½d. per lb.; round wire, 10g. in coils (10 per cent.), 4s. 4½d.; special quality turning rod, 10 per cent., ½ in. dia., in straight lengths, 4s. 3½d. All prices are net.

Other Metals.—Magnesium, ingots, 2s. 2½d. to 2s. 3d. per lb.; Antimony, English, 99 per cent., £230 0s. 0d. Quicksilver, ex-warehouse, £62 0s. 0d. Nickel, £660 0s. 0d. Aluminium, ingots, £186 0s. 0d.; aluminium bronze (BS1400), AB1, £240; AB2, £247.



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Advertisements (accompanied by a remittance) and replies to Box Numbers should be addressed to the Advertisement Manager, Foundry Trade Journal, John Adam House, 17/19, John Adam Street, Adelphi, London, W.C.2. If received by first post Monday advertisements can normally be accommodated in the following Thursday's issue.

SITUATIONS WANTED

PRACTICAL FOUNDRYMAN, over 30 years' experience, recently purchased small Foundry, producing sand castings in all grades Aluminium, wishes to contact anyone able to provide regular work for two or three moulders. Can offer very good terms. All replies answered. Box PF19, FOUNDRY TRADE JOURNAL.

TECHNICAL SALES EXECUTIVE desires to represent Midland and West of England firms in the London and Southern England areas. Excellent contacts. Moderate fee. Write Box TS5, FOUNDRY TRADE JOURNAL.

FOUNDRY MANAGER (49) seeks position on commercial side of castings industry. Can offer sound experience in sales and liaison. Personal contacts over a wide area and range of industries. A fully trained foundryman in all aspects of the industry. Prepared to be based anywhere but would prefer southern half of England. Box FM1, FOUNDRY TRADE JOURNAL.

SITUATIONS VACANT

FOUNDRY/WORKS MANAGER required for West Midlands repetition Malleable Iron Foundry with Machine Shops. Must be experienced and have ability to organise and control labour. Full particulars please, in confidence, Box FW15, FOUNDRY TRADE JOURNAL.

FOUNDRY TECHNICIAN for grey iron foundry producing plate and cored castings up to 10 cwt. Young man aged about 30 preferred, with experience in Sand Rammer and Jolt Squeeze machines, green sand and CO_2 production methods. Quality control activities will be main responsibility. National Foundry College training an advantage. Apply PERSONNEL OFFICER, Thomas Potterton, Ltd., Emscote Road, Warwick.

FOUNDRY MANAGER required for modern mechanized foundry producing whiteheart malleable iron castings. Must be fully experienced, with good technical background, capable of organizing labour for maximum efficiency. Progressive appointment with good pension and life assurance scheme. Reply in writing, giving full details of experience and salary required to: GENERAL MANAGER, Builers Limited, Tipton, Staffs.

AN OLD established Public Company in the South West Midlands has a vacancy at Director level for a man who has wide and varied experience of all types of Foundries. The Company operates both Ferrous and Non-ferrous Foundries and is looking for a DIRECTOR to develop and extend these. Age preferably 35-45. First rate salary and prospects for suitable person. Apply in confidence, giving full details. Box AO12, FOUNDRY TRADE JOURNAL.

SITUATIONS VACANT—*contd.*

MSL *have been retained to advise on this appointment.*

FOUNDRY MANAGER

India

to be responsible to the General Manager of an Indian engineering company of high repute for its well-staffed modern steel and iron foundries having an output of about 1,000 tons per month using the latest techniques. The appointment, inland from Calcutta, is for a single tour of at least two years and might suit a man nearing retirement: it carries free family return passages, cumulative local and/or home leave, and rent-free bungalow and medical attention in India. Salary equivalent to £3,000 p.a. would be tax free for a first visit to India.

Not under 40, candidates must be practical foundrymen with several years' recent senior managerial experience of ferrous foundry work, both floor and mechanised and including motor vehicle cylinder blocks and heads. They should offer wide experience of melting, patternmaking, coremaking and moulding methods: experience of hot-blast cupolas will be an advantage. Please send brief details in confidence quoting reference GT.4131 to A. Shaw Maclaren.

In no circumstances will a candidate's identity be disclosed unless he gives permission after a confidential interview at which he will be given full details of the appointment.

MANAGEMENT SELECTION LIMITED
17 Stratton Street, London, W.1

FOREMAN required for Heavy Engineering Foundry. Applicants must have experience in loam, dry-sand and green-sand. Assistance with housing if required. Write full particulars, giving age, qualifications and salary expected to HEAVY ENGINEERING FOUNDRY MANAGER, Carron Company, Carron, Falkirk, Stirlingshire.

WANTED

CHIEF FOUNDRY ENGINEER

for a progressive West Riding Engineering Company, age group 30/45, H.N.C. standard or equivalent. Experience to include installation, maintenance and development of modern Mechanised Foundry Plant and associated ancillaries, including Mains and High Frequency Furnaces. Knowledge of advanced techniques in scheduled and preventative maintenance essential. Apply, giving full details of career and salary expected, to Box W.C. 999, FOUNDRY TRADE JOURNAL

PRACTICAL STEEL FOUNDRY ENGINEER, fully conversant with running and risering techniques required for senior position in a specialist Division of an International Company supplying chemical/metallurgical products to the foundry and steel industries of the world. The position, which is U.K. based, will involve considerable travel abroad and a working knowledge of at least one European language is desirable. The successful applicant should have had several years' experience as a Methods Engineer in a medium/large steel foundry and should preferably have a University degree or equivalent qualification. The position is pensionable and the salary will be commensurate with experience and qualifications. Box PS13, FOUNDRY TRADE JOURNAL.

METALLURGIST

REQUIRED by old established company of aluminium founders. Successful applicant will have sole charge of new well-equipped laboratory and all metal control in foundry. This is a responsible and interesting position. Contributory pension scheme. House available on appointment.

Full particulars age, qualifications, experience, etc., should be addressed in confidence to:—

PERSONNEL OFFICER,
THE MANGANESE BRONZE & BRASS COMPANY LTD.,
Deans & Lightalloys Division,
Grovehill, Beverley,
East Yorks.

SITUATIONS VACANT—*contd.*

PATTERN SHOP FOREMAN required by expanding Jobbing Ironfoundry in Nottinghamshire. Experience with Pipework advantageous. Good wages with bonus to applicant having drive and initiative. Full details in confidence to Box PS16, FOUNDRY TRADE JOURNAL.

FOUNDRY FOREMAN wanted. Small Non-ferrous Foundry, North London. Knowledge of Gravity Die and Sand Casting. Write giving details of qualifications and salary required. Box FF10, FOUNDRY TRADE JOURNAL.

A Grey Iron Foundry in the Glasgow area, a subsidiary of a large Industrial Group, has vacancies for the following:—

(a) Foundry Superintendent

and

(b) Foundry Metallurgist

Candidates should preferably be experienced in engineering and alloy iron castings. Applications, giving details of experience and present salary, will be treated in confidence.

A Group Superannuation Scheme is in operation.

BOX AG.14. FOUNDRY TRADE JOURNAL.

FOUNDRY MANAGER

REQUIRED for small steel foundry using 10-cwt. High Frequency Melting Unit now in course of erection at Chesterfield.

The position requires a man with initiative and drive, capable of organising labour efficiently to get the plant into production.

Sound practical experience and technical knowledge of all phases of small steel castings production is essential.

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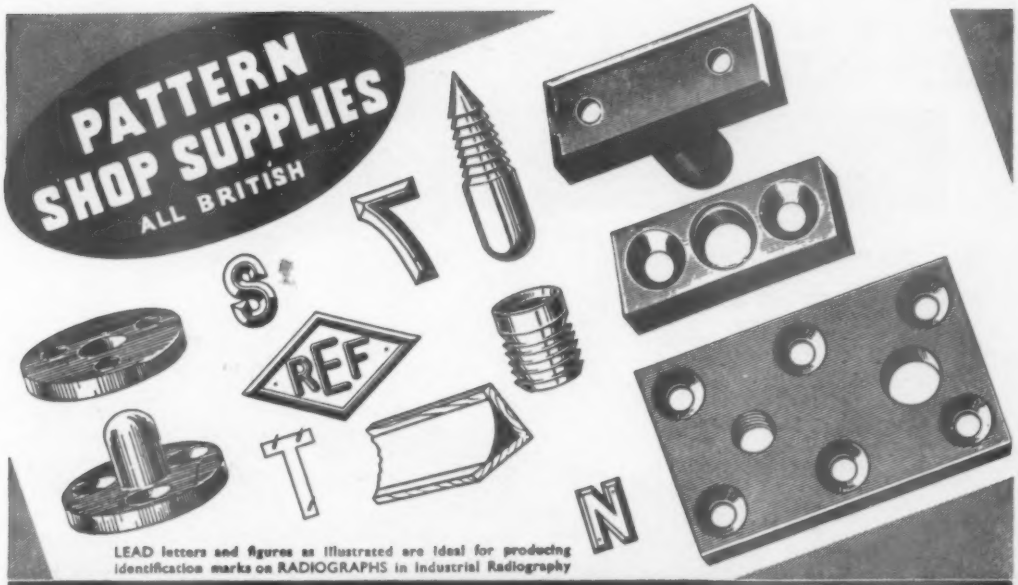

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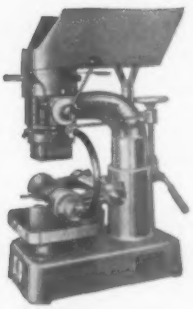

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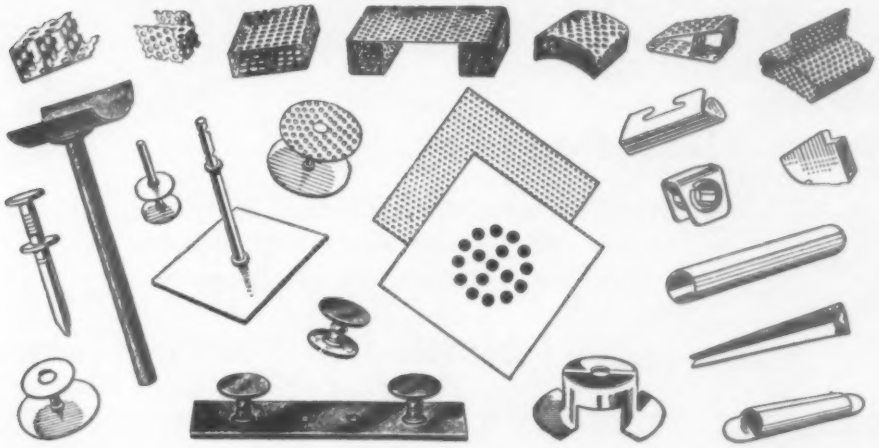

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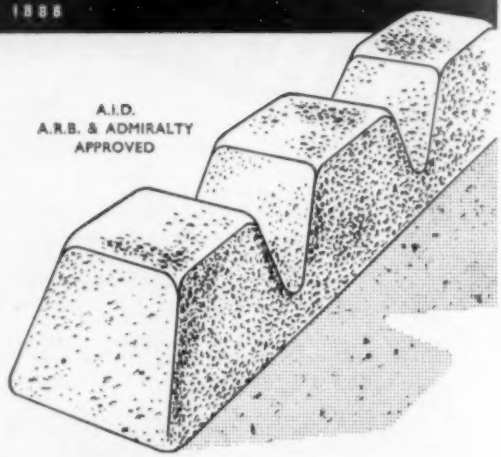

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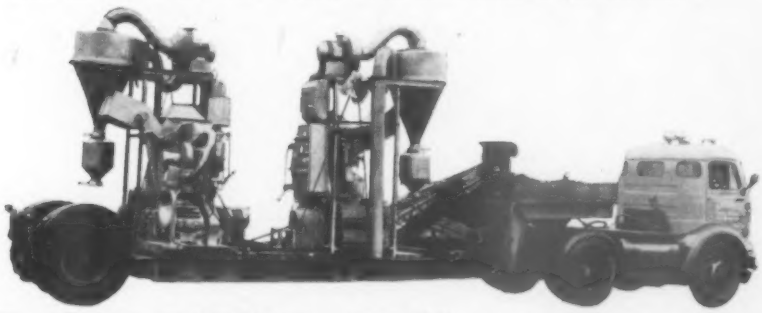

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